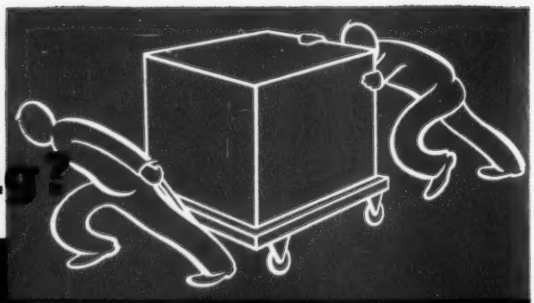
Flow

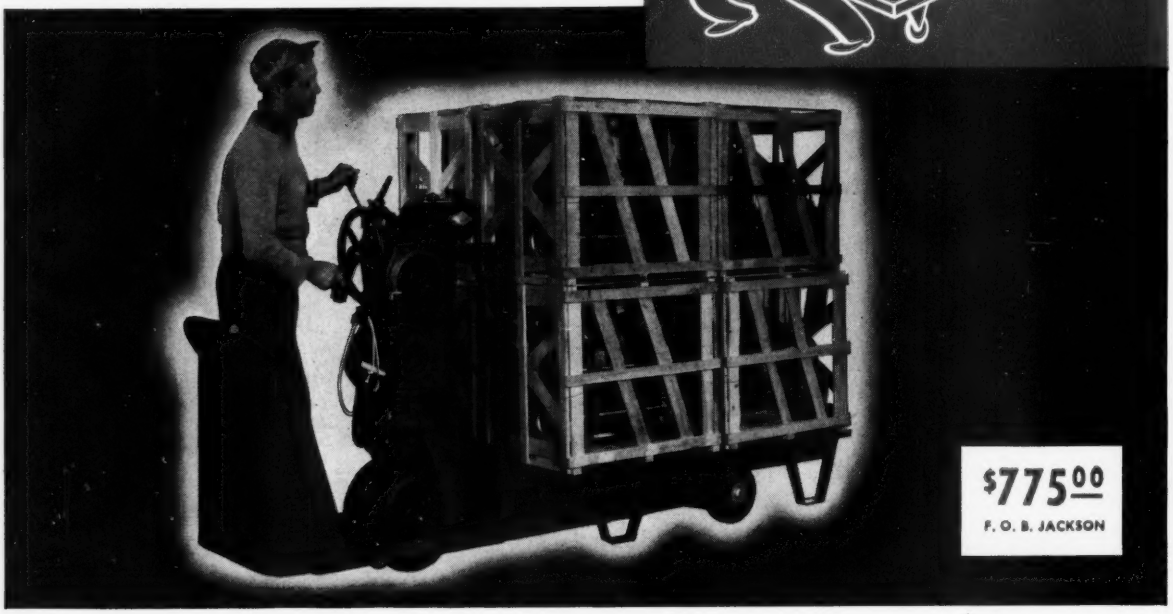
... THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTION

THIS NATIONAL MAGAZINE COMES TO YOU WITH THE COMPLIMENTS OF

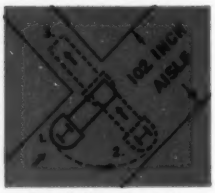
MONTGOMERY EQUIPMENT CO.

Can You Afford the High Cost of Push-and-Pull Hauling?





Users get 8 hours of continuous operation per gallon of gas.



Truck-Man turns in its own length!

9 out of 10 of all shop loads are LESS than 1 TON.

Thousands Have Switched to truck-man for Low-Cost Hauling

HERE'S HOW TRUCK-MAN SAVES YOU TIME AND MONEY:

- Truck-man lifts and hustles skidded loads up to 2000 lbs.—without starting or dropping shocks—safely, easily, quickly . . .
- Turns in 360°—snakes into holes its own length—increases usable floor space . . .
- Grouped controls speed and simplify operation—anyone can operate without fatigue . . .
- Speeds briskly on straightaways—creeps in narrow aisles and close squeezes . . .
- Drives on big DUAL pneumatic-tired wheels for traction and easy riding. Heavy solids carry the load . . .
- Stands the gaff—tireless, day in, day out! Maintenance and running costs are negligible. TRUCK-MAN is ECONOMICAL TO OWN, EASY TO BUY!

IF TIME AND MONEY MEAN ANYTHING TO YOU, get the FACTS on TRUCK-MAN. *Write now for new Model D folder.*

Sixty-five Truck-Man distributors in principal centers provide standard service.

truck-man INC. • 1418 West Ganson • Jackson, Mich.

How I Added Another Story to My Plant

And Found An Amazing Way To Cut My Handling Costs

$40,153.72

It was a lucky day for me when I decided to have an ATCO Specialist come in and survey my material handling costs. I did so at the invitation of his company, when I read one of their advertisements promising a 50% cut in material handling costs.

It sounded fantastic then, but I'm here to tell you they not only delivered enormous material handling savings for our company, but made it possible for us to add another story to our plant ABSOLUTELY FREE!

This was accomplished by a moderate investment in Automatic Electric Trucks. These miracles of electric power move, lift and stack many thousand pounds of material daily, from receiving through shipping.

They do double duty, too, for they stack to ceiling heights — gave us the equivalent of an extra story in our plant by using free air space from floor to ceiling.

Now, with just one man at the controls, three to four men required for the same manual moving and lifting operation, are released for more productive work. Labor welcomes these mechanized electric material handlers. And no wonder. It ends for them gruelling, back-breaking manual handling.

For me, it has saved our business $40,153.72 in one year. And we enjoy an extra bonus of increased production, more free storage space . . . in fact, another story to my plant . . . No wonder I say, "Let an ATCO Specialist survey your handling methods and costs." There is no obligation. Send the coupon.

Automatic
ELECTRIC TRUCKS
Lighten LIFE'S LOADS

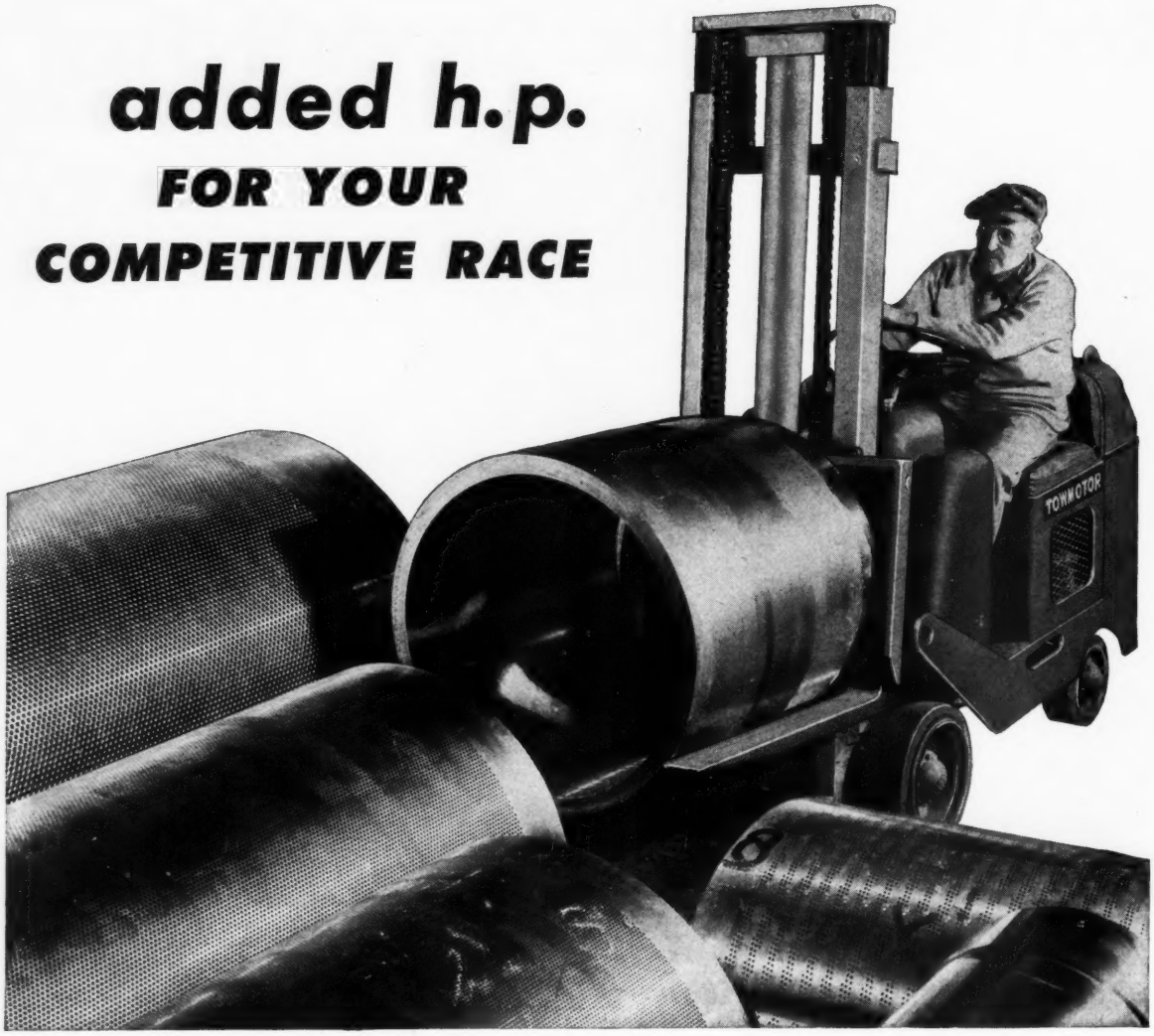
AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE & TOWNE MFG. CO.
141 West 87th Street, Dept. W-7, Chicago 20, Ill.

Please mail me, without cost, complete facts on how I can cut my material handling costs with Automatic Electric Trucks.
( ) Have an ATCO Specialist make a free survey of my material handling methods and costs.

Company Name .....
By ..... Position .....
Street Address .....
City ..... Zone ..... State .....

MANUFACTURERS OF THE FAMOUS TRANSPORTERS, TRANSTACKERS, AND SKYLIFT ELECTRIC TRUCKS

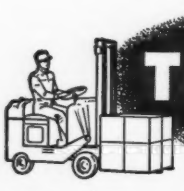
added h.p.
FOR YOUR COMPETITIVE RACE



TUNE UP your production machine for the competitive race, and let Towmotor Fork Lift Trucks and Accessories provide the added horsepower that will keep you out in front. With Towmotor maintaining a scheduled flow of materials between every phase of operation, your production machine will function smoothly and swiftly . . . you'll get maximum output at minimum cost.

There's a Pocket Catalog that lists the complete line of Towmotor Fork Lift Trucks and Accessories . . . send for your copy today. Towmotor Corporation, Division 8, 1226 East 152nd Street, Cleveland 10, Ohio.

SEND FOR SPECIAL BULLETINS DESCRIBING THE **TOWMOTOR** REVOLVING CARRIAGE • SIDE SHIFTER UNLOADER • UPENDER • SCOOP • CRANE ARM • EXTENSION FORKS • EXTENSION BACKREST • RAM • OVERHEAD GUARD



TOWMOTOR **FORK LIFT TRUCKS *and* TRACTORS**

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

VOLUME 3, No. 12

Flow

NOVEMBER, 1947

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REFRIGERATION INDUSTRY

COVER PHOTO—Once shipped singly in cartons, these refrigeration compressors are now quickly assembled into 48-unit pallet loads, here shown being strapped for shipment. The article on page 32 gives details on savings and operational advantages.

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You Can Heft 12 tons with a Pushbutton...

for less than the cost of your newspaper

...WHEN YOU LIFT IT WITH A YALE—

It would take a lot of time, and muscle to handle the kind of tonnage a Yale Hoist can take care of in a day. Yet it's no trick at all for a Yale Cable King Electric Hoist to handle tons and tons of material all day long with ease, speed and safety. And the cost per ton is only a few cents. Compare this with what it's costing you to do the job with muscle power.

When Yale power replaces manpower, you get more output per manhour, lower cost per ton of material handled. That's why it will be worth your while to get all the newest facts on Yale's material handling methods and machinery.

SEND TODAY FOR FREE NEW 70-PAGE "HOW" BOOK

This material handling handbook, the first of its kind ever to be offered, shows you how to measure your present material handling costs and how to cut them. Send for your free copy today. Ask for the "How" book. Address: The Yale & Towne Manufacturing Co., 4559 Tacony St., Philadelphia, Pa.

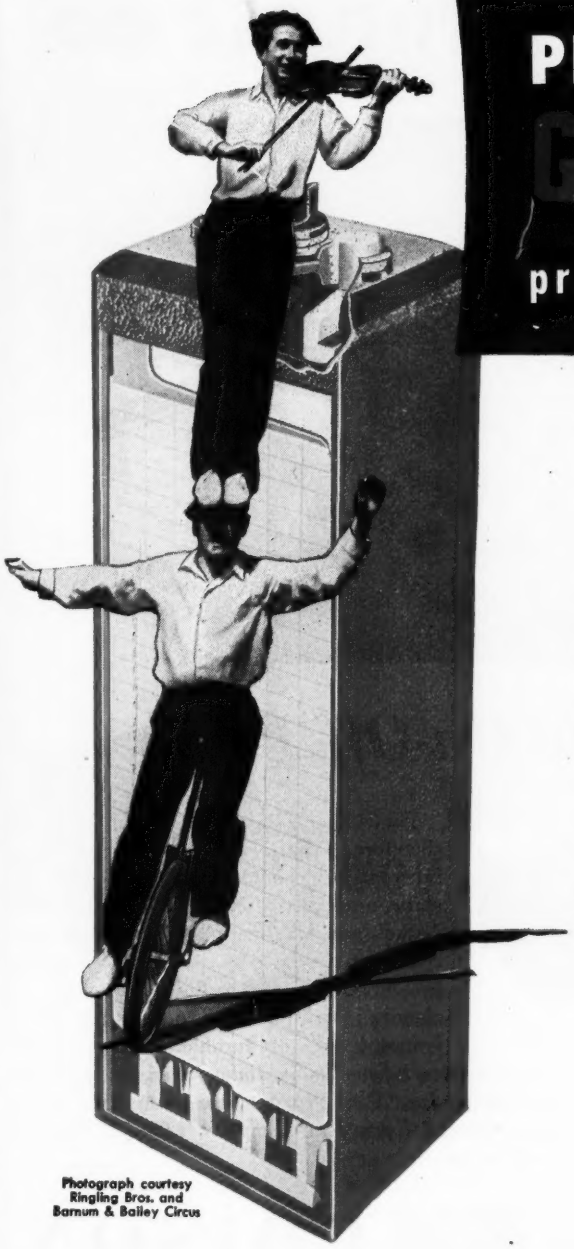
MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS ... SAVES TIME ... SAVES EFFORT ... PROMOTES SAFETY

YALE

INDUSTRIAL DIAL SCALES • HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC

PLATE BALANCE in GOULD Batteries produces *Twin Power*

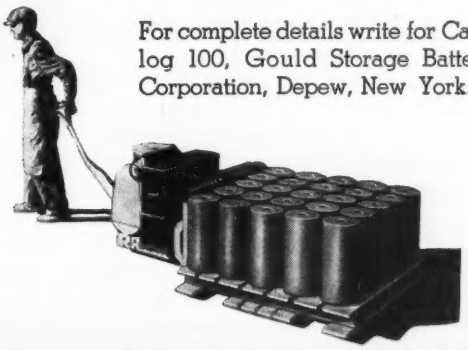


Photograph courtesy Ringling Bros. and Barnum & Bailey Circus

Positive and negative plates work as a team to create lasting power for the efficient operation of electric industrial trucks

Latest development of Gould research is an improved negative plate. It has been brought into ***balance*** with the well-known Kathanode positive unit. As a result both sides of each Gould Kathanode Battery carry their full share of the load. Battery efficiency is improved.

Unbiased tests by an independent laboratory show that Goulds deliver a higher sustained voltage through each normal discharge period. Electric industrial trucks powered by Gould Kathanode Batteries will run faster, and do more work.



For complete details write for Catalog 100, Gould Storage Battery Corporation, Depew, New York.

GOULD STORAGE BATTERY CORPORATION

Including the Philco Corporation, Storage Battery Division

Factories and sales representatives in thirty-one principal cities

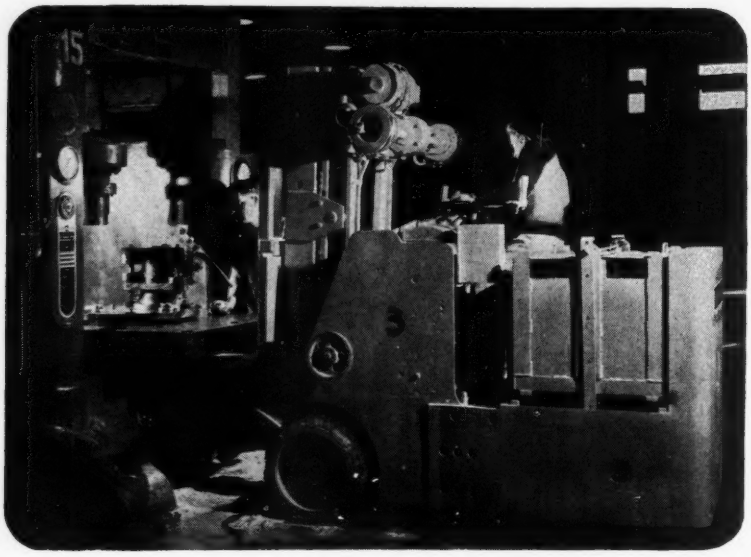
GOULD

"Thirty" and KATHANODE

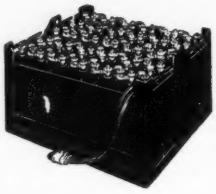
BATTERIES

PICKED BY ENGINEERS

Handling Work is **STOP** *and* **GO**



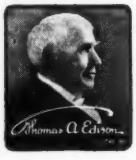
and Needs Instant-On-Off Power



In replacing a loaded skid box with an empty beside a machine, an industrial truck will make an average of approximately 14 moves forward, backward, up and down. A battery industrial truck has a natural advantage in this kind of stop-and-go service because it gets the necessary surges of power instantly from its battery, yet consumes no power during the stops. Thus it is not only economical of power, but the electricity used for charging its batteries is low-cost power.

Its electric-motor drive operates quietly, without vibration, and thus with well-nigh negligible repair requirements. With batteries exchanged two or three times per 24 hour day, it is continuously supplied with power and, since one battery is charged while the other works, the truck need not stop work for servicing of its power unit.

For 24 hour-a-day material-handling work, therefore, a battery industrial truck is an inherently dependable and economical machine, especially when powered by EDISON Nickel-Iron-Alkaline batteries. With steel cell construction, a solution that is a natural preservative of steel, and a foolproof electrochemical principle of operation, they are the longest-lived, most durable, and most trouble-free batteries. *Edison Storage Battery Division of Thomas A. Edison, Inc., West Orange, New Jersey.* In Canada: *International Equipment Company Limited, Montreal and Toronto.*



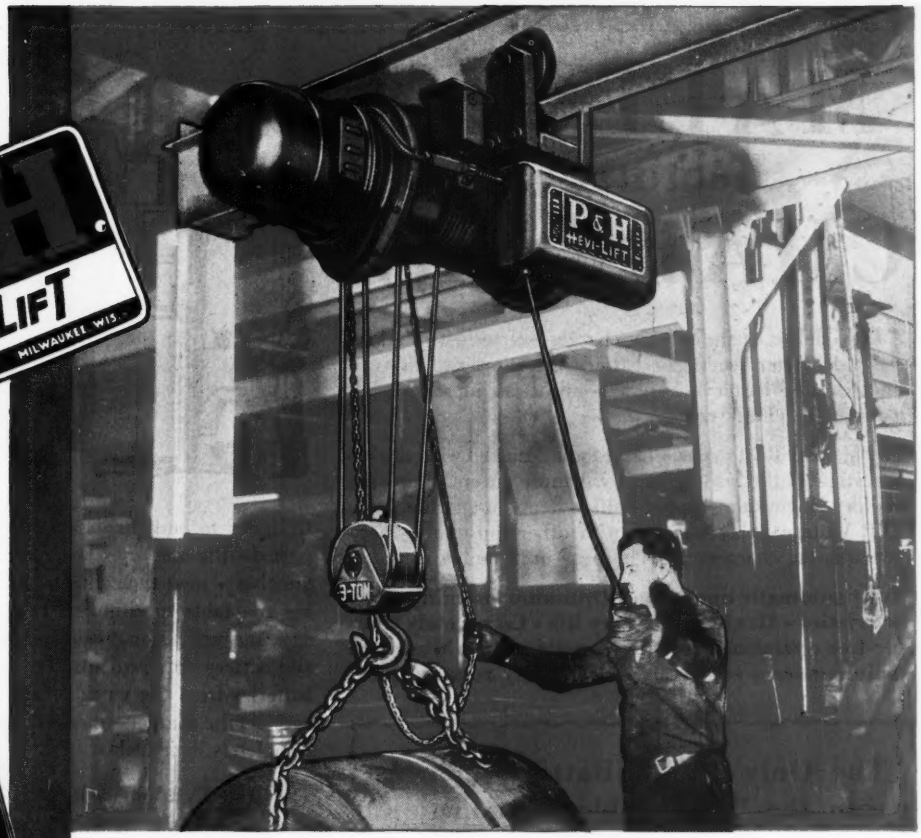
EDISON

Nickel • Iron • Alkaline

STORAGE BATTERIES

In Industrial Trucks, EDISON Nickel-Iron-Alkaline Batteries Give You These Important Advantages.

1. They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel. 2. They can be **charged rapidly;** gassing cannot dislodge the active materials. 3. They can **stand idle indefinitely** without injury. Merely discharge, shortcircuit, and store in a clean, dry place. 4. They are **simple and easy to maintain.** 5. They **withstand temperature extremes;** are free from freezing hazard are easily ventilated for rapid cooling. 6. They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents.



P&H HEVI-LIFT MILWAUKEE, WIS. HARNISCHFEGER CORP.

Here's everything you want to know about P&H Hevi-Lifts . . . applications, pictures, specifications. It's Bulletin H5-1 — yours for the asking.

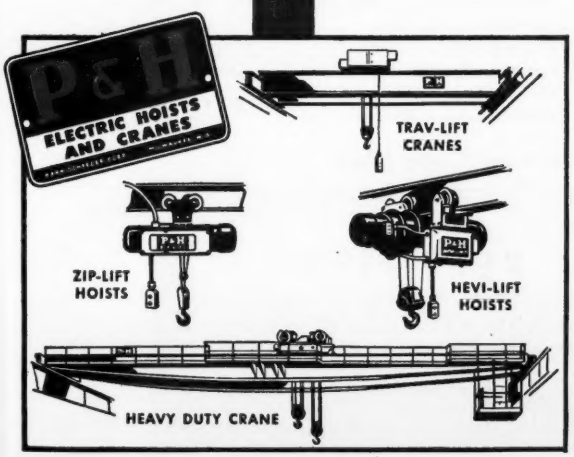
YOU DON'T PAY FOR REHANDLING

when you move loads "THRU-THE-AIR!"

That's where you make the big saving! From the time your loads are picked up, until they're "spotted" into place, you have no rehandling at all. No "muscling" before and after . . . your P&H Hevi-Lift Hoist does *all* the work, quickly, effortlessly.

- Think of the time and energy saved!

Skilled hands are never kept waiting, never tired by needless work — push buttons do it all! The P&H Hevi-Lift, with capacities up to 15 tons, brings every advantage of "thru-the-air" handling to all types of plants. For advice on your specific needs, consult a P&H Hoist Engineer . . . or see bulletin at left.



The "Extras" Are STANDARD EQUIPMENT, Added Values on P&H Hevi-Lift Hoists

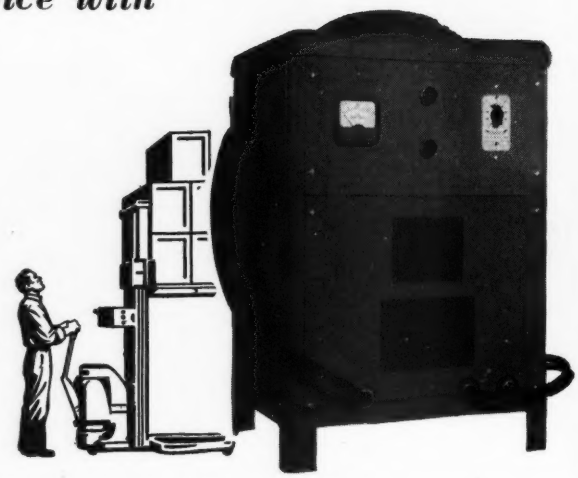
- Shaved gears for lifetime service . . . all bearings grease-sealed.
- Thermal overload protection against motor burn-outs . . . twin brakes for extra safety.
- Motors specifically designed and built by P&H for hoist service — high starting torque, frequent reversals, etc.
- Effortless push-button control . . . available for all motions and with variable speed feature.
- Transformer provides 110 volts at push-button.
- P&H's true motor ratings assure against failure at full capacity loads and speeds.

P&H ELECTRIC HOISTS
4643 West National Avenue
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

Faster, SAFER Charging Service with

MALLORY
Rectotruck†
CHARGERS



LONG delays at the battery charger—time lost in taking hydrometer readings—battery life shortened through uncontrolled battery charging—all these increase your material handling costs.

The Mallory Rectotruck Charger was designed with the cooperation of the leading battery manufacturers. Using the Mallory Magnesium-Copper Sulfide Rectifier and the Exide TVR Voltage Relay together with other top quality components, the chargers provide these outstanding features:

Fully automatic operation • Optimum charging characteristics • Maximum battery life • Completely trouble-free operation • Maximum service life • Minimum maintenance—ventilating fan is only rotating part.

Designed to be light in weight, compact and easily transported—the Mallory Chargers can be moved so that they are always near the center of your trucking activity. They are adaptable to either of two standard power line voltages and will accommodate wide variations in line voltage and battery requirements. You do not need to remove the batteries from the truck in order to charge them. Simply connect the charger—its operation is completely automatic, completely dependable.

The Exide TVR Voltage Relay is the magic eye that watches over the charging curve. It insures against an overcharge damaging your battery. No hydrometers to read—no ampere hour meters to set. Everything is automatic from the initial charge to the safe finish charge. Give your batteries a noon-hour boost in the truck—it means longer battery hours and lower costs.

Mallory Chargers are designed in three models to suit every electric hand truck battery charging need. Three other Mallory battery chargers are available for standard truck battery charging.

Order your Mallory Rectotruck Charger from your electric truck agent through

Automatic Transportation Co.
Baker Industrial Truck Div.
Barrett-Cravens Co.
Clark Tructractor Div.
Crescent Truck Co.
Elwell-Parker Electric Co.
Lewis-Shepard Products, Inc.
Lift Trucks, Inc.
The Mercury Mfg. Co.
The Moto Truc Co.
Wright-Hibbard Industrial Electric Truck Co., Inc.
The Yale & Towne Mfg. Co.
Philadelphia Division

The Only Truck Battery Charger with the "Unbeatable Combination"

P.R. MALLORY & CO. Inc. MALLORY *and* Exide

Magnesium Copper Sulfide Rectifier

Most rugged, dependable rectifier for low-voltage, high-current application.

Unaffected by high temperature operation under adverse atmospheric conditions.

Phenomenal ability to withstand abuse and accidental short circuits. Self healing.

Stable, consistent charging without adjustment over long life.

Minimum maintenance—no brushes, bulbs, sparking contacts.

TVR Voltage Relay
(Reg. U. S. Pat. Off.)

Precision temperature-compensated voltage relay.

Exclusive, patented inverse temperature compensating feature.

Operates during rapid rise in charging voltage characteristic of a lead battery.

Reduces high initial charging rate to low safe finishing rate.

Starts synchronous timer which controls length of time at finishing rate.

Approved by leading lead battery manufacturers.

Rectifier Charger Pioneers Since 1927

P.R. MALLORY & CO. Inc.
MALLORY RECTIFIERS
MAGNESIUM COPPER SULFIDE RECTIFIERS—RECTOPLATERS*—
RECTOTRUCK CHARGERS—AVIATION RECTOSTARTERS*—
RECTOPOWER* SUPPLIES—AUTOMATIC BATTERY CHARGERS
*Reg. U. S. Pat. Off.

† TRADE MARK

P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA

HURRY! HURRY!

Contest closes Dec. 15

Write the Flow Contest Editor Now!

Shipping costs are being studied by all business today. Improved shipping methods by use of modern mechanical means may be your prize winner.

Streamlined your receiving operations? A paper describing equipment installed, advantages obtained, cost economies effected may win you $500.

Perhaps you have re-designed processing methods for greater economy by using more efficient material handling equipment. A discussion of the cost factors will make a good subject.

The affect on unit cost of your products might be a prize-winning paper if you can show how the manufacturing costs were reduced through use of more efficient handling methods and equipment.

Space is money in warehousing. If you've gained additional space or efficiency through revised handling methods and equipment . . . reduced warehousing costs, enter the cost facts.

FOR INFORMATION AND ENTRY BLANK

To highlight advanced cost control methods employed by leading industries FLOW has sponsored the "Cost Facts" Contest. FLOW believes cost methods and accounting to be of tremendous importance to industry. It is offering $1,500 in prizes for the best papers covering the cost factors in the installation of material handling equipment in any field, any industry or department. Time is short. The contest closes December 15. Where, through the installation of material handling equipment, your company has increased efficiency and lowered costs and the figures are available — a paper describing it in the FLOW "Cost Facts" Contest may win a cash prize. You still have time, but send for your rules and entry blank today.

Flow MAGAZINE 1240 ONTARIO STREET CLEVELAND 13, OHIO

Give your industrial trucks the

run-of-your-building

WITH AN OTIS POW-R-TRUCK ELEVATOR

An Otis Pow-R-Truck Elevator multiplies the usefulness of your industrial trucks by the number of floors in your building!

With an Otis Pow-R-Truck Elevator, loaded trucks are free to travel to any floor in your plant. This means no time wasted in re-handling of loads and better utilization of manpower.

Extra-rugged Pow-R-Truck Elevators are the world's only standardized line of elevators built specifically to provide safe vertical transportation for heavy fork and lift trucks . . . the only line specially reinforced to withstand the severe impact and off-balance stresses caused by industrial truck loading. They are available in the size, speed and capacity best suited to your needs.

If you'd like to know more about these Pow-R-Truck Elevators that add the "third dimension" to your materials-handling system, write for Bulletin 664 to Otis Elevator Company, 260 Eleventh Ave., New York 1, N. Y.

Otis

ELEVATOR COMPANY

Offices in all principal cities

ROSS Model 18-HT Lift Truck handling box shook.

OWNERS REPORT* *Savings of 50-75%*

Since streamlining lumber handling with

The ROSS *System*

of STRADDLE CARRIERS and LIFT TRUCKS

Same ROSS 18-HT Lift Truck handling logs.

Here are lift trucks and straddle carriers you can rely upon to give you lowest handling costs per-thousand feet. Here's day-in-and-day-out performance of a kind that's possible only because of ROSS' more than thirty years' experience in developing straddle carriers and heavy-duty lift trucks. *ROSS* designed and built the world's *first* straddle carrier and *ROSS* is still *first* and *foremost* with lumbermen who *know!*

It will pay you to plan your future operations around THE ROSS SYSTEM of Straddle Carriers and Lift Trucks. Complete information is yours on request. . . . Ask for Bulletin F-10-7.

*** Names on request.**

Rely On ROSS

ROSS CARRIER CO.

Factory: BENTON HARBOR, MICHIGAN

G-E RECTIFIERS HANDLE TOUGH JOB AT PRATT & WHITNEY AIRCRAFT

Efficient chargers help to keep batteries of 100-truck fleet in top operating condition

Using more than 100 electric trucks to move materials in its huge plant at East Hartford, Connecticut, Pratt & Whitney Aircraft operates its battery department two full shifts a day to keep equipment running.

Playing an important role in this daily maintenance operation, General Electric copper-oxide battery chargers have proved their ability to deliver the type of heavy-duty service that is required, and to deliver it with the efficiency and the economy that keeps materials handling costs low.

At Pratt & Whitney Aircraft, as at many other modern plants, the use of General Electric rectifiers for electric trucks is based on performance records. Experience has shown that this hard-working equipment is easy to maintain, and is always reliable. It needs little attention on the part of its operators, and can be counted on for long service.

Many Advantages for Any User of Electric Trucks

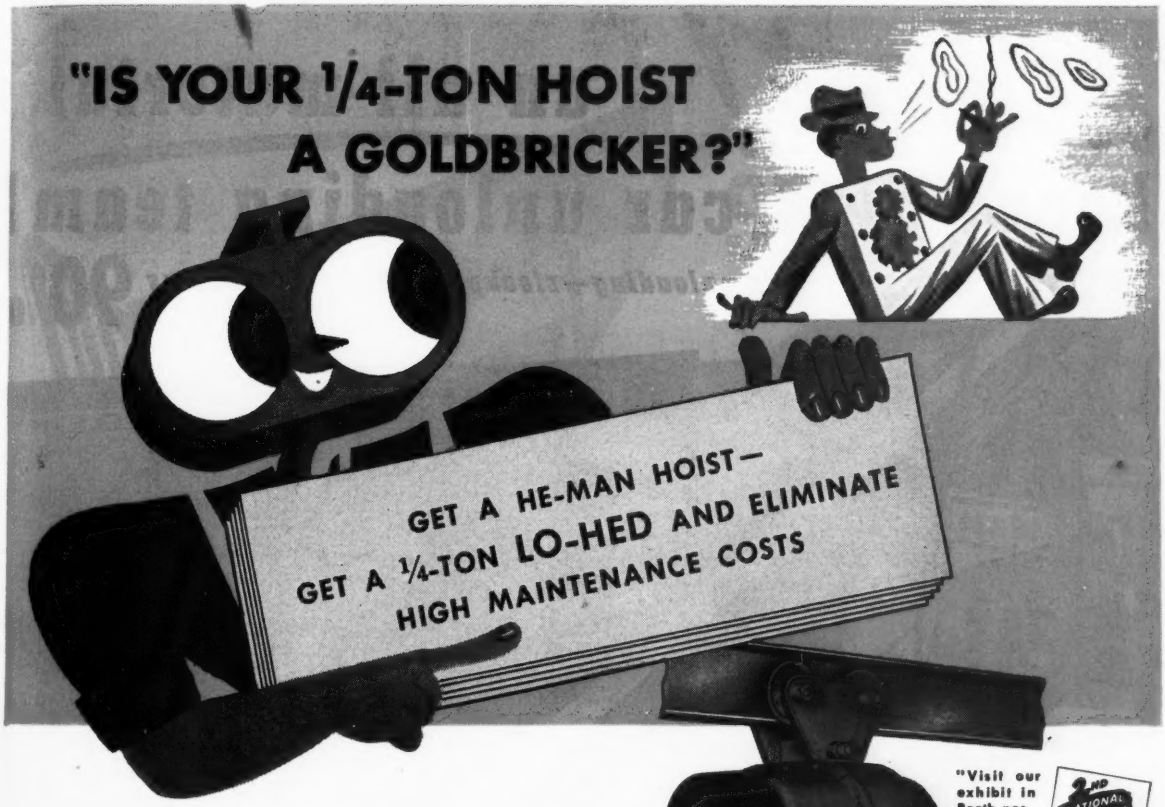
Perhaps you, too, have a problem that involves more efficient flow of materials.

We would like to show you how the strategic spotting of General Electric rectifiers can help —by keeping unnecessary truck movement at a minimum, by eliminating traffic jams, and by increasing truck operating time.

Let us send you a copy of our useful booklet, *Aids To Economical Faster Materials Handling.* Write to Section A-77-1136, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.

General Electric's copper-oxide rectifiers are installed in convenient, space-saving banks. Batteries are easily connected to receive their big, off-duty charge.

GENERAL ELECTRIC



In the army there's a word and a place for a fellow who lies down on the job. There's a place for a ¼-ton hoist that doesn't deliver, too, and it isn't on your beam.

If your hoist is lying down on the job, better get a Lo-Hed Heavy-Duty ¼-ton Electric Hoist.

When you say "Lo-Hed ¼-ton Hoist," it's the same as saying, "easier, faster, dependable materials handling." Every inch of this machine is heavy-duty, designed to give you the same low maintenance and long life for which the larger Lo-Heds are famous. Lo-Hed Hoists are made in ¼-ton to 12-ton capacities. Hoist without trolley weighs 195 lbs.; plain trolley hoist, 225 lbs.

Write today for the complete Lo-Hed catalog describing in detail all Lo-Hed Hoists.

Lo-Hed Hoists operate on standard I-beam or can be adapted to operate on track of any make.

"Visit our exhibit in Booth nos. 432-433."

2ND NATIONAL MATERIALS HANDLING EXPOSITION

ANOTHER PRODUCT OF Æ

LO-HED ELECTRIC HOIST

- Weight 225 lbs. (Plain trolley), 195 lbs. (Bolt Suspension)
- Motor—HEAVY-DUTY hoist and crane type with high starting torque.
- Gearing—HEAVY-DUTY spur.
- Lowering Brake—HEAVY-DUTY Weston automatic.
- Electric Brake—FULL LOAD torque capacity.
- Control Pendant—HEAVY-DUTY Push Button Station.
- Control Cord—HEAVY-DUTY super service, rubber covered, reinforced by pull-cable.
- Trolley—Special shockproof construction.
- Factor of Safety—5 at FULL LOAD.

OTHER Æ PRODUCTS
Æ-TAYLOR AND PERFECT SPREAD STOKERS, MARINE DECK AUXILIARIES, HELE-SHAW FLUID POWER, LO-HED CAR PULLERS

AMERICAN ENGINEERING COMPANY
2531 Aramingo Avenue
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Please send me without obligation your complete catalog of Lo-Hed Electric Hoists.
Name_____
Company Name_____
Address_____ State_____
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LO-HED *Electric* HOISTS

PRODUCT OF AMERICAN ENGINEERING COMPANY
PHILADELPHIA 25, PENNSYLVANIA

At last! an all-material, heavy-duty car unloading team!

Cuts unloading—stockpiling time as much as 90%

EXCLUSIVE NEW ADVANTAGES!

For All Materials *. . . Crushed stone, granite chips, sand, gravel, agricultural lime, coal, road stone, coke, foundry sand, cinders, clay, chemicals, fertilizers, ores, wet concrete, etc.*

For All Users *. . . Road contractors, building supply yards, concrete products plants, foundries, quarries, railroads, ceramic plants, industrial power plants, chemical plants, etc.*

Imagine a portable car unloader and stockpiler that can clear a car of stone or rock in 45 minutes! Imagine an unloading "team" that requires only one man's time . . . that frees expensive clamshells and other equipment for more productive work . . a team rugged enough to deliver up to three tons per minute through years of service, yet economical enough to pay off on intermittent work!

That's what Barber-Greene offers you in the new 358 and 363. Now for the first time you can truly eliminate hopper-car unloading problems, no matter what bulk materials you're handling!

Send for Full Details!

Use the coupon, or write for complete data, photos and specs on the 358 and 363.

Barber-Greene Company
Aurora, Ill.

☐ Send details on the 358 and 363

☐ Have a B-G representative call

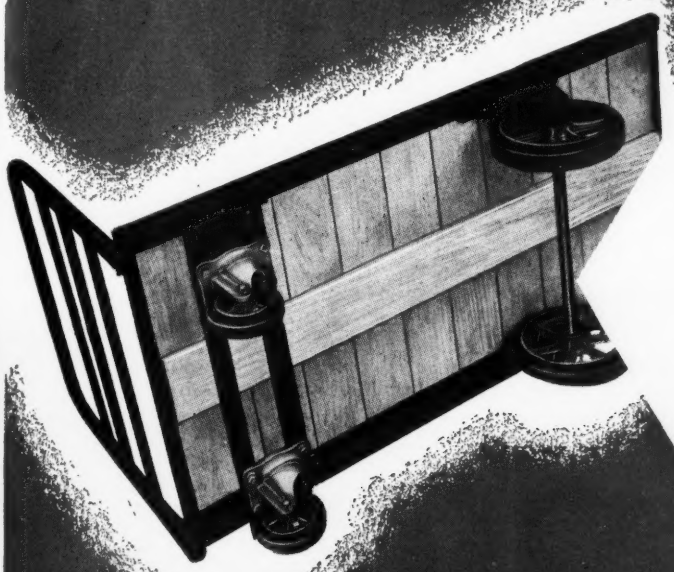
Name .....

Street .....

City ..... State .....

B G Barber-Greene

BARBER-GREENE COMPANY
AURORA, ILLINOIS



STEEL
WHERE IT'S NEEDED

WOOD
WHERE IT'S NEEDED

FAIRBANKS STEEL-FRAMED TWO-WHEEL TRUCK is available in 28 sizes and types to meet specific job requirements

FAIRBANKS . . .
Steel-Framed Trucks

● Your truck costs go down and your men get more done in less time with Fairbanks Steel-Framed Hand and Platform Trucks.

The reason is simple. Fairbanks has effectively combined the structural advantages of steel and wood to provide hand and platform trucks that stand up under all kinds of punishment in service . . . that have shock-absorbing qualities which cushion heavy loads, dampen vibration, reduce operator fatigue.

Like all Fairbanks Trucks (over 90 basic designs with hundreds of variations) each of these Steel-Framed trucks is developed from on the job experience to put the maximum speed and ease into specific types of load-handling. For example, the "Commander" Steel-Framed Platform Truck shown above comes in 20 sizes from 24" x 42" to 36" x 72", with 3 platform heights (18", 14", 9½") and Tilt or Non-Tilt running gear.

Full information on any one or the complete line of Fairbanks Trucks may be had from any of the offices listed below.

American Industry Rolls on Fairbanks Trucks

THE **fairbanks** COMPANY

820 Atlantic Avenue, Boston 10, Mass. — 15 Ferry Street, Pittsburgh 22, Pa. — 745 M & M Building, Houston 2, Texas — 202 Division Street, Rome, Ga.

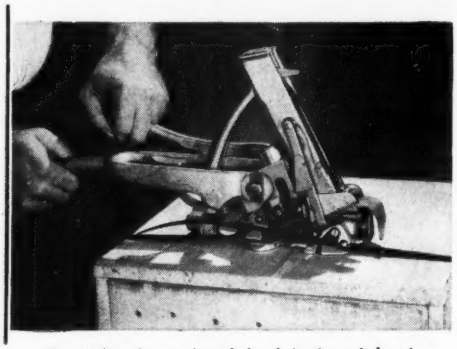
4 steps... 5 seconds!

that's production strapping with the improved Stanley "ACE" Strapping Tool

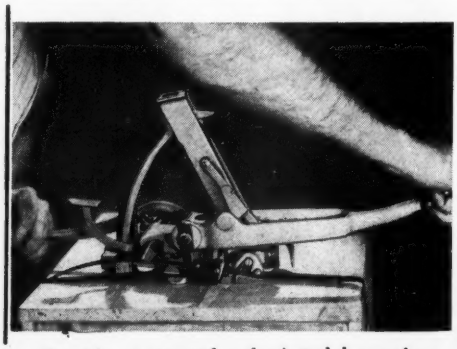
• ALL THAT takes just 5 seconds. Positive spring feed holds a 100 seal clip in magazine for 3/8" and 1/2" seals and a 75 seal clip for 5/8" seals. The "Ace", with a complete line of accessories, is available in 3 sizes to handle the whole range of strapping jobs. Write for full details or demonstration. The Stanley Works, Steel Strapping Division, 203 Lake Street, New Britain, Conn.

1 *Free end of strapping is slipped under straplock and against stop.*

2 *Loop of strapping is slipped under straplocks and between shear blades and pulled tight.*



3 *Strapping is tensioned by bringing tightening handle back to horizontal position.*

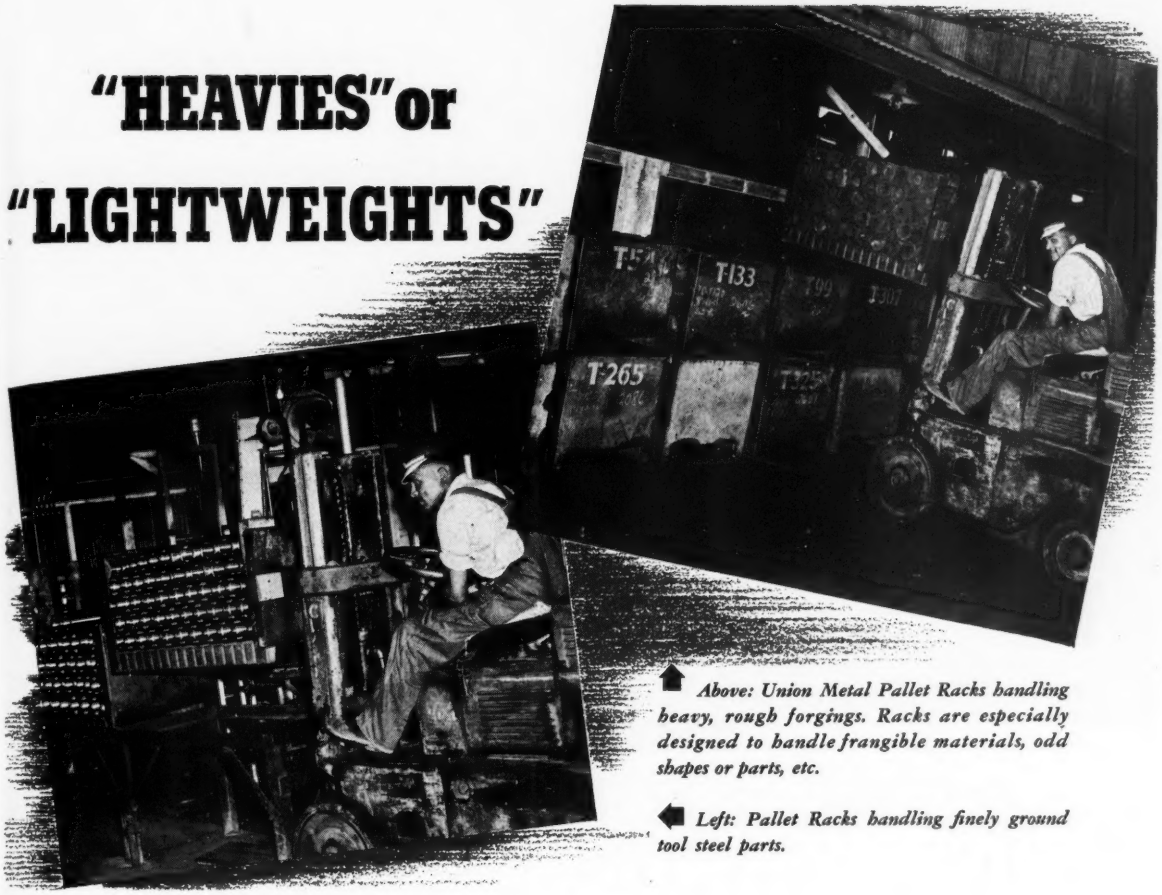


4 *Strapping is cut and seal crimped by moving sealing lever forward.*

STANLEY

STEEL STRAPPING AND CAR BANDING SYSTEMS

"HEAVIES" or "LIGHTWEIGHTS"



Above: Union Metal Pallet Racks handling heavy, rough forgings. Racks are especially designed to handle frangible materials, odd shapes or parts, etc.

Left: Pallet Racks handling finely ground tool steel parts.

They're handled easier at lower cost with . . .

UNION METAL Pallets . . . Boxes . . . Skid Platforms

PICTURED above are two of the many ways in which Union Metal materials handling equipment is used to cut handling costs and move materials quicker, safer. These *steel* units give you other advantages, too. They—

Keep floor space clear for production needs . . .
Effectively use every cubic foot of storage area . . .
Increase production line efficiency.

In hundreds of industrial plants, Union Metal boxes, pallets, and skid platforms have *proved* they're time-savers—cost-cutters. Here's why: These units are designed and engineered to do the jobs intended; they are rugged and long-lasting; they're produced by Union Metal . . . specialists in steel fabrication for over 40 years.

Call upon Union Metal engineers for help on your materials handling problems. They're at your service. The Union Metal Manufacturing Co., Canton 5, Ohio.

SEND FOR FREE BULLETIN MH-806

Shows you typical examples of the many ways Union Metal skids, boxes, and pallets increase plant efficiency.

UNION METAL

Materials Handling Equipment

"...AND

Battery Powered

TRUCKS, OF COURSE . . . FOR LOWEST-COST MATERIAL HANDLING."

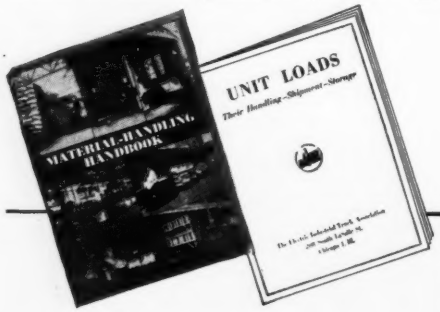
IN new plants—or old, planning for a smooth, dependable flow of materials is one big step toward greater profits.

The step is longest, surest, when industrial trucking applications are assigned to *battery-powered* equipment with its unequalled ability to keep pace with rigorous schedules and *at the lowest cost per ton handled.*

Actually, "lowest-cost-per-ton-handled" is a direct dividend from the following factors which make electric trucks the most dependable. No moving parts in the battery, *one* in the motor, hence negligible maintenance cost. Down-time with electric trucks is so infrequent that standby equipment is unnecessary in many plants. And electric power—central station power—costs 60% less.

We believe that such performance and savings, peculiar to battery-powered industrial trucks, are more important to you than low first cost.

Over 90% of the electric industrial trucks sold in the past twenty years are still in constant, active service.



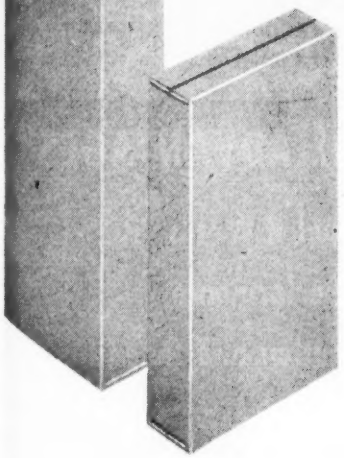
THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION

29-28L Forty-first Avenue, Queens Plaza, Long Island City 1, N. Y.

SEND FOR THESE FREE MANUALS—The MATERIAL-HANDLING HANDBOOK and UNIT LOADS have shown thousands of leaders in industry how to plan for the BIG savings in solving handling problems. Write for your copies.

Seals Long, Narrow Cartons that No Other Machine Can Handle..

ABC Fully Automatic SIDE SEALER



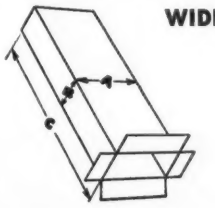
The most costly and difficult of all sealing problems are solved with this one machine, amazing in its performance. Seals both ends of those long, narrow, top-heavy cartons that no "erect position" machine will handle. Handles all thicknesses of corrugated containers . . . also heavy solid fiber cases. Offers you a definite money saving.

Quick electrical adjustment from one size carton to another is a matter of seconds. Speedily-adjustable and easily-accessible glue pots insure even, thin film of glue, and minimum cleaning time. Soundly engineered. Built of finest materials throughout, will give you years of dependable, trouble-free service.

SPECIAL ENGINEERING SERVICE
Packaging machines correctly designed and constructed to fit Your own special requirements.

WRITE FOR DESCRIPTIVE CIRCULAR

(Give dimensions of your range of cartons)



WIDE RANGE OF ADJUSTABILITY
(diagram)

Length (A) 4" to 26"
Height (B) 2¼" to 14"
Width (C) 7" to 25"

ABC PACKAGING MACHINE CORP.
QUINCY, ILLINOIS

THE SEARCH FOR BETTER THINGS

. . . goes on constantly by the manufacturers of Electric Industrial Trucks, Charging Equipment and Storage Batteries, to improve the performance of their products and to insure a better and faster job of material handling — at lower cost.

The competent design engineers of the Electric Industrial Truck Industry are continuously improving the equipment which will solve your present and future material handling requirements.

Crescent Model LHVH End-Control *Palletier*
Special design for operation in congested warehouses

SPECIFY

Aircool

BATTERIES

C & D *Aircool* ADVANTAGES

- 20% Additional K.W.H.'s
- Guaranteed Performance
- *Fourfold* Insulation and Retention
- Patented *Aircool* Design
  Cool and Clean
- Dependable and Rugged
- Lower Initial Cost
- Competent Service
- Fast Shipments from Factory Stock

C & D Batteries, Inc., Conshohocken, Pa.— *Building Better Batteries for more than 40 years*

HEAVY DUTY BATTERIES FOR ELECTRIC INDUSTRIAL TRUCKS • ELECTRIC LOCOMOTIVES • DIESEL LOCOMOTIVES
AIR CONDITIONING AND CAR LIGHTING • TELEPHONE • MARINE • AUXILIARY POWER

Serving the **INDUSTRY** *in the Broadest Sense*

THE Material Handling Industry has grown up.

Last year saw the first Material Handling Exposition ever to be held. Veteran industrial showmen said that it was the most successful "first show" they had ever seen. Exhibitors were more than gratified at the attendance, both qualitatively and quantitatively. Many firms which "waited to see" were disappointed because they had not participated.

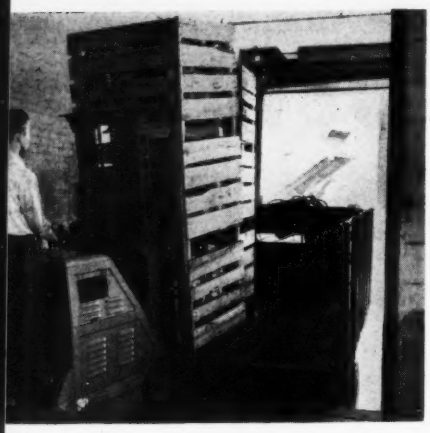
Now we are preparing for the Second Annual Material Handling Exposition, to be held in Cleveland January 12-16, 1948. Three times as much space has been sold as was used last year. Double the number of products will be on display. The exhibits will, for the most part, be of the live, operating type.

The program committee is planning helpful technical sessions. The annual banquet, Wednesday, January 14, will be addressed by a man who is known throughout industry. He is the president of an important large national businessmen's organization, the president of a large manufacturing company, and an industrial engineer in his own right. It will be a pleasure to listen to him because he talks "right down our alley."

This past year has seen another significant development. The Material Handling Institute under the able guidance of S. W. Gibb has developed into a vital force in the industry. No longer is the Institute beset by petty jealousies which wrecked it before. The constructive program outlined for it by its able secretary R. K. Hanson is awakening a spirit of help and cooperation from almost a hundred members. New members are joining the Institute every week. They are beginning to see that the Institute is not favoring any one kind of equipment over any other. It is not a "truck" Institute, a "conveyor" Institute nor a "caster" Institute. It is devoted to the Material Handling Industry in the broadest sense. It has no special interest regarding any single type of equipment. It is doing a job for the whole industry.

All this has happened in FLOW'S lifetime. It didn't all happen because of FLOW, but we have done our best to help in this constructive program. We have tried to be constructive because it is the function of a leading trade paper in an industry to take a leading position and not to hang back to "wait and see." While industries help make trade papers, trade papers like FLOW help make industries, too.

Irving B. Hexter



STACK AT A TIME. Thousands of stampings are unloaded in a few minutes. Truck waiting time is no longer a problem.

IN HANDLING THESE STAMPINGS . . . . .

you can multiply the savings by two

Here are the improvements obtained: 1. A seven-to-one saving in square footage, eliminating a warehouse.

2. Costs slashed to a point that was a surprise to management.

3. Truck unloading time of 10 minutes as against three hours.

4. Extra effort and time saved because of better stock control, better housekeeping, accessibility of materials.

FORK TRUCKS, STACKING BOXES

"IT'S astonishing how much our fork truck handling of stampings in stacking type boxes has saved us." This was the statement of William A. Mattie, plant superintendent of the Eaton Manufacturing Company's Heater Division, Cleveland. The Heater Division assembles thousands of automobile hot water heaters daily as original equipment for many makes of cars.

Since a heater may contain up to 75 different types of parts, many of them stampings, the total number of the formed pieces of sheet steel handled quickly runs into astronomical figures. The stampings are made from stock ranging from 12 to 24 gauge, and the monthly volume received and stored totals close to one million pounds.

The items are shipped by outside suppliers on highway trucks, and previous to the adoption of the present fork - truck - box method they arrived in two ways: either in 55-gal. steel drums, or loose.

The single-deck storage of drums presented the familiar problem of using an excessive amount of square footage. So much storage space was required, in fact, that the company had to maintain two warehouses, for stampings and other heater parts.

The handling was decidedly costly when the stampings arrived loose in the delivery trucks. First, of course, there was piece-by-piece loading at the vendor's plant, followed by three additional handlings of each individual piece at the Heater Division. This was through receiving, storage and delivery to the point of use.

Using Available Cubic Space

During the first half of this year, the company made a study of the problem and decided to handle the stampings in stacking type boxes which could be handled by fork trucks. The receiving area in the assembly plant has a ceiling height of better than 15 feet—valuable cubic space in which the boxes could be stacked.

In cooperation with a pallet manufacturer, company engineers designed a crate-type box, made of ¾" hardwood lumber, which is shown in the accompanying photos. The inside dimensions of the containers are (allowing for slight variations) as follows: 20" wide, 38" long, and 25" high, giving an average content of 10½ cubic feet. A four-inch under-clearance permits handling by fork truck, and the corner posts are recessed 1½ inches at the top for stacking purposes.

The company started with 1,000 containers, which were gradually increased in accordance with expanding production schedules. According to Plant Superintendent Mattie, the total number of boxes is expected to be 2,500 in the near future.

The millions of stampings handled range in size from two inches to 10 inches square. Only two, 2000-pound fork trucks, of the

three-wheel type, are used for the entire operation. These light models are amply sufficient for all handlings in connection with the large volume of material.

At the vendor's plant—we'll have more to say about this phase of the operation later—the loaded boxes are stacked up to four high in the outbound vehicles. At the Heater Division, a whole tier of boxes is picked off at one time from the truck beds. The removal of three to four boxes at one time, as compared with the previous unloading of individual pieces, explains how unloading time per truck was reduced from the former maximum of three hours to only 10 minutes. The boxes are run to the nearby stacks, where they are tiered (usually two at a time) five high, or 12½ feet to the top of the stack.

As indicated in the sub-title, the resultant space economy is remarkable. With the present high-stacking method only one square foot is used for every seven required before with single deck storage of steel drums. The stampings are now stored in the compact 80′ x 80′ receiving area, which directly adjoins the processing and/or assembly operations. Thus the previous use of an entire warehouse could be discontinued, also the former warehouse-to-plant hauls by highway truck. And the moves from the present storage area by fork truck are economically short.

The wooden containers permit the convenient attachment of tags, which show the part number and the quantity in each box. The storage practice is orderly and time-saving, because specific locations are assigned to each type of item. This means of course that inventory is also simplified.

When the material is needed for production, no time is lost in searching. This was a problem when the stock was handled in barrels. It was often necessary to move many in order to get at those needed. The fork truck runs up to the stack, detiers the required boxes, and the loads are quickly transported to the point of use. Frequently a truck will transport two boxes at a time.

What happens to the empties? They represent no storage problem. When a vendor's truck de-

(Turn to page 78)

USE OF CUBE. Square footage of compact storage area was multiplied seven times by tiering.

TO PRODUCTION. Every move is a saving with new method because of effortless handling in quantity.

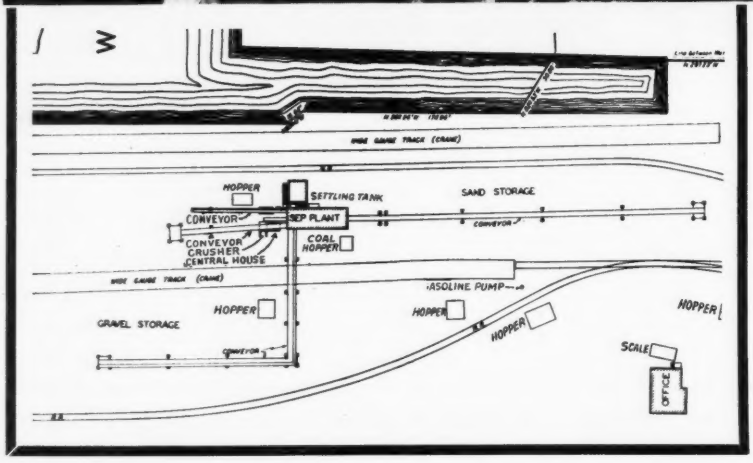


Photo above and drawing left, courtesy PIT AND QUARRY.

SHIP AND SHORE CONVEYORS. Boat delivers gravel to screen house. "South" sand stockpile, foreground. Drawing, at left, shows position of screen house, yard area and slip.

MOVING A 300% GREATER VOLUME OF SAND AND GRAVEL

LAND EQUIPMENT GOES TO SEA. View of sand-sucker with clamshell mounted on 20-foot deck tracks.

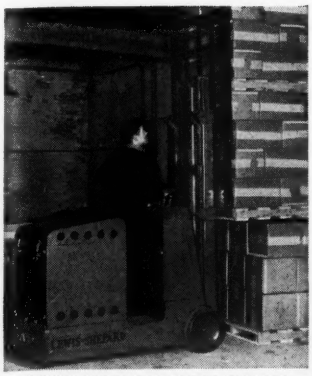
Photo below and those on page 70, courtesy EXCAVATING ENGINEER.

A modern handling installation moves a 300 per cent greater volume at this sand and gravel company, with no increase in manhours. The over-all system includes a self-unloading ship, a seagoing clamshell, and a belt conveyor system that serves screening and storage functions.

WHEN a bulk material handling plant increases productive capacity from 100 tons to 300 tons per hour, you can expect some newsworthy applications in handling procedures. This one coordinates a self-unloading ship with the shore installation in a continuous operation, achieving high-volume production with an absolute minimum of manhours. The plant is that of the Erie Sand and Gravel Company, Erie, Penna.

The company processes sand and gravel for building construction, road work and other uses. The yard, located on Lake Erie, is approximately 700′ x 2,000′. The ma-

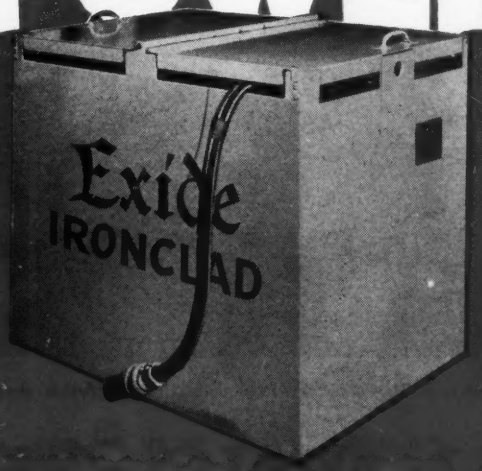
(Turn to page 70)



LEWIS-SHEPARD FORK TRUCK

DEPENDABLE

POWER



EXIDE-IRONCLAD POWER
AND BATTERY ELECTRIC TRUCKS

The efficient, cost-cutting team that speeds materials handling

You gain all along the line when your materials are handled by electric trucks and Exide-Ironclad Battery Power. This modern efficiency team keeps goods moving in greater volume, and saves time and money all day long.

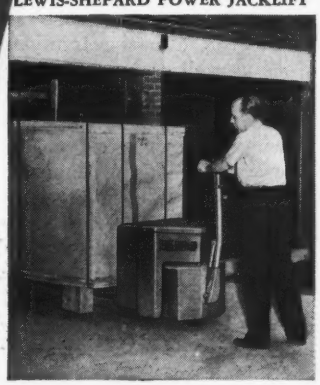
Exide-Ironclad Batteries are preferred for electric truck service because of their great power and dependability . . . a result of special Exide-Ironclad construction, which is unlike that of any other battery.

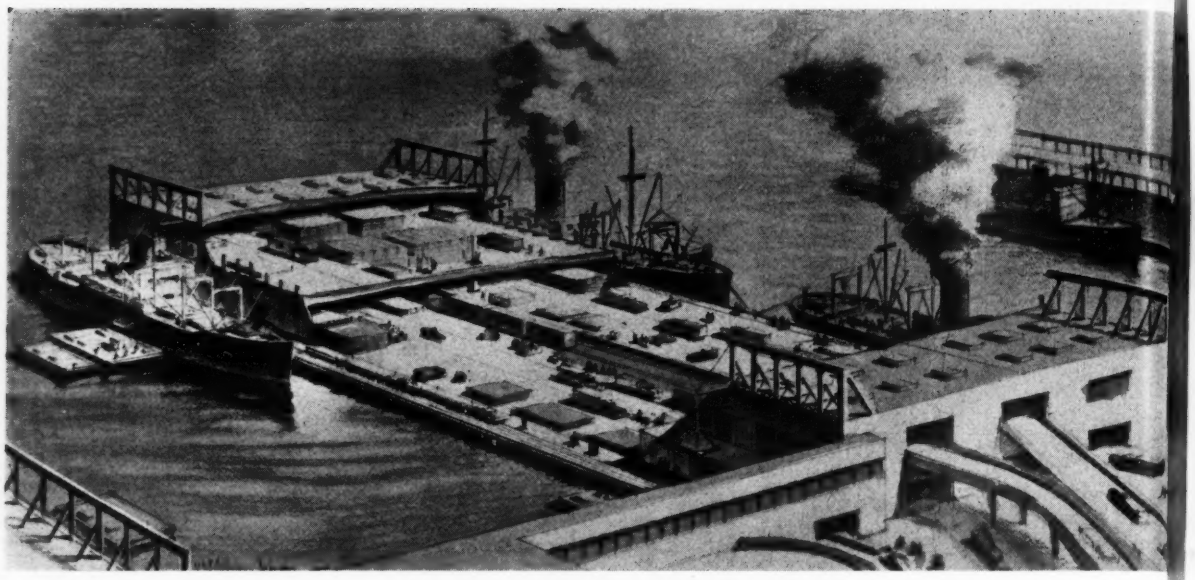
One important Exide-Ironclad feature is the positive plate which consists of slotted tubes containing the active material. So tiny are these slots that, while permitting easy access of the electrolyte, they prevent the active material from readily washing away. The results are high power ability, longer life, greater economy and safety.

Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of material handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

LEWIS-SHEPARD POWER JACKLIFT





Cutaway drawing of proposed two-deck structure. Article gives complete details. Note the vehicular ramps, foreground.

PLANNING THE WORLD'S

THE MATERIAL HANDLING DEVICES PLANNED FOR THIS PIER COVER A WIDE RANGE OF EQUIPMENT

Many U. S. commodities are destined for export shipment, and hence manufacturers and shippers are vitally interested in modern pier handling facilities that will move their goods without delay, without extra handling charges. Here is a specific proposal, now on paper, for an up-to-date freight pier. Designed around mechanical handling equipment, the new $13,000,000 Hoboken Pier No. 4 is expected to eliminate the evil of truck waiting time and keep ship turnaround time to a minimum.

MUCH has been said about the need for modern freight pier design, and now the Port of New York Authority has proposed to do something about it. Criticism has been leveled at present outmoded piers from many quarters—from specialists in marine terminal facilities as well as manufacturers and exporters. The basic points of the criticism can be stated in the following somewhat simplified summary. Pier design has not kept pace with the development of present-day highway vehicles, the advances in modern cargo ship design and the strides made in material handling equipment and techniques. Built 20 or more years ago, piers have remained narrow and with inadequate floor load capacity. These drawbacks, in turn, have resulted in excessive port time, truck waiting time and poor flow of materials in congested facilities, with attendant higher costs to steamship operators and shippers.

Meeting a Need

The present proposal of the Port of New York Authority, when authorized and completed, would bring pier design in step with the tremendous advances which have marked the development of highway vehicles, cargo ships, and material handling facilities. These improvements revolve around the Port Authority's proposed design for the new Hoboken Pier No. 4. It has been recommended in a report which has been submitted, after an extensive survey, to the city commissioners of Hoboken. While the proposed pier is still in the discussion stage—its realization is contingent on many administrative and legal technicalities—the plan merits going into detail here as an important development in marine terminal handling practices. If realized, the project is bound to have a far-reaching influence on future pier design and related material handling procedures.

Here is a thumbnail-size resume of the steps that led to the new No. 4 Pier project. In World War I the government seized the Hoboken piers of the Hamburg American Line and the North German Lloyd Company (1918), and since

MOST MODERN PIER

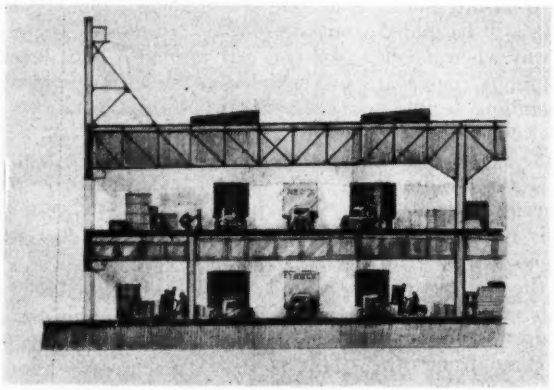
that time the Hoboken city commissioners have repeatedly asked Washington for the return of the piers and adjacent property to private industry. Over a period of years three of the six piers burned down, representing a complete loss, and the city of Hoboken has suffered large-scale civic and commercial set-backs due to loss of revenue from ships and many supporting industries. The purpose of the return of the piers to private industry would be (a) to make the fullest possible utilization of this valuable terminal area, (b) yield a tax revenue and (c) improve the Hoboken business and employment situation.

This situation led the Hoboken city commissioners to request the Port of New York Authority* to make a survey with this twofold aim in view. 1. To improve the three existing piers. 2. To create a new pier development to replace the three old Hamburg American piers that burned down. This second phase is the specific subject of this description, with particular emphasis on the factors that have a bearing on material flow and material handling.

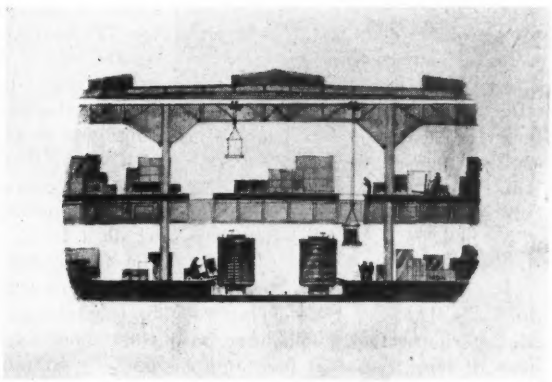
***The Port of New York Authority is a self-supporting corporate agency jointly created in 1921 by treaty between the States of New Jersey and New York. Among the Port Authority's specific responsibilities are the following: deal with the planning and development of terminal and transportation facilities, improve services and reduce transportation costs of commodities in and through the Port District. Thus the new Hoboken Pier No. 4 project is one of the Port Authority's statutory functions.**

Innovation in Hoist Application

The three remaining older piers which will undergo a $4,000,000 repair and modernization operation, illustrate the points stated previously that summarize the criticism regarding such facilities. While each pier can berth four ships, there is not sufficient space on any one of them for more cargo than from one ship, or about 12,000 tons, giving a four to one ratio. (All references to tonnage will be to revenue tons.) With a width of 70 feet, the piers naturally offer obstacles to the maneuvering of today's huge truck-trailers. This not only ties up vehicular traffic but also has a tendency to interfere with ship loading and discharging operations. Another big obsta-

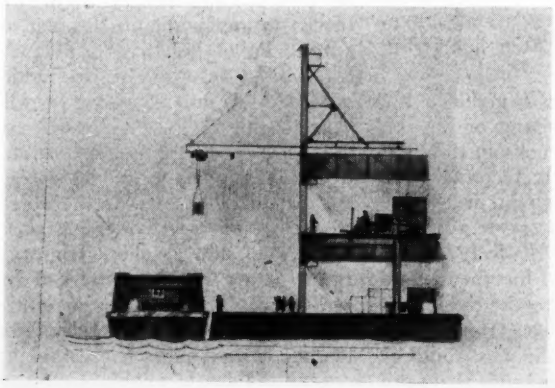


Center truck lane maintains traffic flow, while fork trucks load, unload vehicles on both sides.

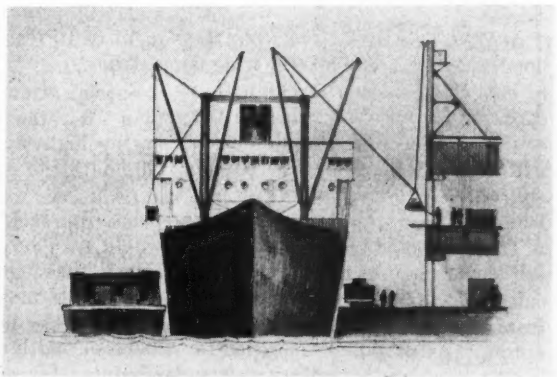


Exceptional flexibility. Hoists make possible movement from cars on lower deck to top level.

Proposed hoist handling permits unloading lighter to pier floors without derrick on lighter.



Two-side operation with double cargo masts: to car on apron, to either pier deck, to lighter.



cle to efficient cargo handling is that the second deck, a wooden one for passengers, is capable of handling only 200 pounds per square foot. For efficient operation with modern handling equipment, the floor load capacity should be between 400 and 600 pounds per square foot.

How pallets will be stacked at truck's tail gate to receive cargo for export shipment.

Here pallet load is going aboard. Note bar sling and rugged marine type pallet.

The design of the new Pier No. 4, reproduced on these pages, will offer sufficient space and handling facilities to assure rapid turnaround time for ships, lighters, railroad cars and trucks. There will be sufficient space to permit handling of four of the latest type freighters simultaneously.

As can be seen from one of the drawings, the pier is to be a two-deck structure. It will have an over-all length of 950 feet and a width of 330 feet. A 376-foot-wide slip to the north is to be shared with Pier 3, and a slip 200 feet wide is recommended on the south. This size pier will permit the berthing of four cargo ships, two on each side.

At the first-deck level, on the north side, an apron 30 feet wide is to have two railroad tracks with a capacity for 16 cars each. On the south side, a 12-foot-wide apron without tracks is proposed. At the end, there is to be an apron 30 feet wide.

The proposed design includes full-length house masts on both sides. To facilitate working cargo from lighters or from cars on the apron, it is proposed that electric hoists, ranging in capacity from 6,000 to 10,000 pounds, be installed on each side of the pier. These hoists (see drawings) will operate on "I" beams supported by the superstructure at the roof level and will extend on hinged sections 10 feet beyond the apron's edge. Because of the hinged arrangement, the "I" beam tracks will be folded up and out of the way when not in use. Later paragraphs describe these and other handling facilities employed in typical operations.

Running down the center line of the first deck will be three railroad tracks, depressed to bring car floors at deck level. It is intended that the two outer tracks be used for working cars and the center track for switching, with cross-overs at convenient intervals. To make it possible to move cargo from cars on the center tracks to the second deck of the pier, four 6,000-pound hoists will be installed over as many hatches on the second deck. These hoists will operate on trackage supported by the roof trusses and will provide a lateral movement of 10 feet to each side of the hatches.

Special attention is given in the plan for cargo arriving or departing by highway trucks in order to eliminate the costly inconvenience of vehicles "waiting in line." The truck approach to the new Pier 4 would be a broad roadway, so designed that trucks for the second level would move to the right up a two-lane 4½ per cent ramp. The 330-foot width of the pier would be adequate for a planned U-shaped truckway 25 feet wide on each deck, providing for one-way traffic and thus eliminating interference between truck movement and cargo handling. At the easterly end, a truck elevator would make it possible for the vehicles to move from one floor to the other without going outside the pier. Independent access and exit ramps to both levels are included in the design. The advantage of this is apparent.

Plan for Efficient Flow and Handling

Thus flexibility and dispatch in handling are key points of the proposed plan. For example, railroad cars on the north apron could be worked by means of the hoists on the hinged jibs, the house masts or ships tackle to the first or second deck of the pier or ship hatches. It would be feasible to work railroad cars on the center tracks by the overhead hoists (in conjunction with the fork-truck-pallet method) to the second deck, or by fork trucks to any point on the pier or apron. Pallet handling is planned to be used extensively, and additional details on this operation will be given later.

Lighters berthed at the aprons would be worked to either deck of the pier, with the slips wide enough to permit offshore lighters to work to or from ship hatches. Highway truck cargo would be worked by fork truck to any point on either deck for temporary storage or for loading aboard ship. High stacking

(Turn to page 66)

SAVE 50% FLOOR SPACE EQUIPMENT COST LABOR COST

with the

TURNER SYSTEM
OF MATERIALS HANDLING

The Transport is half-truck, half-platform, has the advantages of both, the disadvantages of neither.

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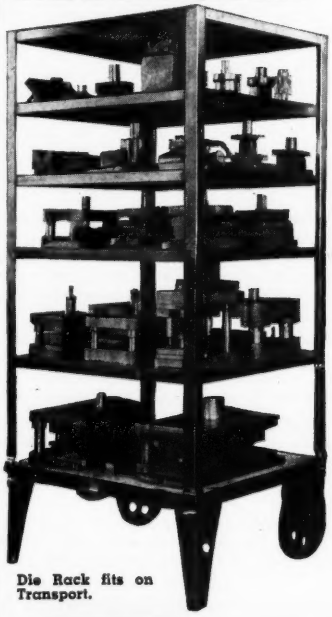
- Provides vertical expansion of loads to ceiling.
- Standardizes every Box, Bin, Shelf and Rack . . . makes every unit quickly movable.
- Puts all materials within arms' reach of the operator.
- Lasts indefinitely . . . every unit welded or riveted . . . wheels and roller pins only moving parts.

Wooden-side Bin Sections on Pallet stacked on All-steel Bin Sections on Transport.



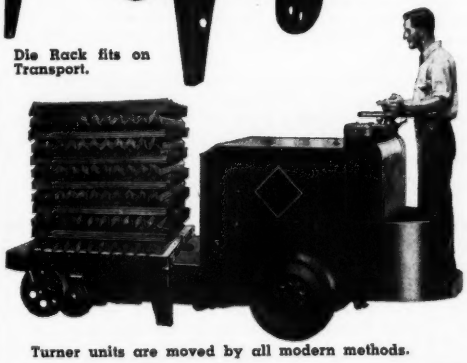
Die Rack fits on Transport.

DELIVER THE BIN AND SAVE THE HANDLING

When you "deliver the Bin" instead of removing small parts piece by piece from stationary bins, you save up to 80% of the time required for transportation of materials to machines. Wooden-side or All-steel Bin Sections, Racks, Trays, Die Tables and Superstructures fit on the Transport which is moved by hand Jimmy, power lift truck, crane or tractor.

60 DAYS FREE TRIAL

You can determine for yourself how much you can benefit from the TURNER SYSTEM by using an assortment of standard units on a 60 DAYS FREE TRIAL basis. Try these units for *two months*. Keep them if (in YOUR opinion) they save labor, time and space. Return them if they don't . . . and you pay nothing except low transportation charges.



Turner units are moved by all modern methods.

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NEW IDEA BOOK

Just off the press, the TURNER SYSTEM BOOK describes a plan for cutting labor, handling and storage expense . . . speeding production, reducing accidents. The book is sent without charge.

FACTORY SERVICE COMPANY

4607 North Twenty-First Street — Milwaukee 9, Wisconsin

Mark this date in

WHY? See How to Reduce Unit Costs by Correct Applications of Material Handling Equipment

WHERE? Second National Material Handling Exposition, Cleveland Public Auditorium

WHEN? January 12 - 16, 1948 (5 Days)

WHO? 20,000 executives interested in labor aiding, cost reducing material handling devices; the manufacturers or their field representatives

WITH more than 200,000 square feet of floor space sold to the first 155 exhibitors, Second National Material Handling Exposition officials have opened an additional area to take care of all displays.

Scheduled for January 12 to 16 in Cleveland Public Auditorium, for the second consecutive year, the Exposition will occupy more than triple the area used last January. The show has been extended to five days.

The Exposition has been moved to include the Lakeside Exhibition Halls of the auditorium. Higher head room in this area removes most of the limits on the size of equipment it will be possible to display.

EQUIPMENT IN MOTION

Virtually all booths will be larger to permit demonstrations of equipment in motion. These increases range from two to five times previous areas used.

Among the types of equipment listed for exhibition will be hand trucks, lift trucks, conveyors, hoists, monorails, portable elevators, stacking units, tractors, trailers, fork trucks, skids and pallets, and numerous accessories.

"The coming Exposition will rank among the top 15 industrial shows of the year", Edwin J. Heimer, chairman of the general committee, declared.

Importance of material handling problems and the search for ways to solve them are expected to bring the attendance to a new high mark. Last January, more than 12,000 top management executives, engineers and production men came from all parts of the world.

The Exposition will be divided into four categories. These include a Conference on Material Handling, the Material Handling Theatre, Institutional Presentation of Material Handling Equipment and Systems, and Commercial Exhibits.

The Conference on Material Handling will present discussions of vital problems connected with the reduction of unit costs of production and distribution. Irving B. Hexter, publisher of FLOW, is chairman of the Conference program committee, assisted by Ezra W. Clark, material handling consultant, Grand Rapids.

Films on handling subjects will be shown in the theater. In charge of this feature are Gordon J. Berry, vice president of Electric Products Co., chairman; R. G. Redhead, same company, vice chairman, and Lester P. Aurbach, vice president of FLOW.

Assisting Heimer on the general Exposition committee, besides Hexter and Clark, are Lloyd Backart, president of Rapids-Standard Co., and R. L. Wolter, sales manager of Automatic Transportation Co., Chicago.

E. I. Burke, manager of shipping, Republic Steel Corp., Cleveland, is chairman of the banquet committee with Elmer F. Twyman, general manager of Automatic Transportation Co., vice chairman.

Publicity is in charge of Wolter, chairman; Milton M. Enzer, assistant to the president of Yale & Towne Manufacturing Co., New York; Paul O. Ridings, president of Ridings-Ferris, Inc., Chicago, and Ed Greif, of Banner & Greif, New York.

Information about the Exposition, exhibit space, Conference program and hotel accommodations may be obtained from the show management: Clapp & Poliak, Inc., 350 Fifth Avenue, New York 1, N. Y.

Discussing the importance of the Exposition to every type of industry, Heimer declared:

"After more than two decades of effort, industry attention was focused for the first time, at the initial exposition, in material handling as a science designed to cut production and distribution costs. This year, with many new exhibitors represented, it will be possible for businessmen to compare different systems of material handling in addition to different manufacturers' equipment."

Mark this Date in '48—January 12-16, inclusive.

'48

FLASH! It has just been learned that Earl Bunting, President of the National Association of Manufacturers and head of O'Sullivan Rubber Co., will address the Annual Banquet, Wednesday, January 14, 1948. See editorial page 21.

Exhibitors to Date

Acme Pallet Co.
Acme Steel Co.
Addison-Semmes Corp.
Aeroquip Corp.
American Engineering Co.
American Pulley Co.
Anthony Co.
Arkansas Pallet Corp.
Automatic Transportation Co.
Automotive Rubber Co.

Baker-Raulang Co.
William Bal Corp.
Barber-Greene Co.
Barrett-Cravens Co.
Bassick Co.
Bearing & Transmission Co.
Better Packages, Inc.
Brainard Steel Division, Sharon Steel Corp.
Brummeler Steel Products Corp.
Buda Co.
E. W. Buschman Co., Inc.

C & D Batteries, Inc.
Caster & Floor Truck Mfrs' Assn.
Chisolm-Moore Hoist Corp.
Clark Tructractor
Cleveland Wire Spring Co.
Coffing Hoist Co.
Colson Corp.
Conco Engineering Works
Conveyor Repair Service, Inc.
Crescent Truck Co.

Dempster Brothers, Inc.
Divine Brothers Co., Inc.
Drake, Startzman, Sheahan, Barclay, Inc.

Economy Engineering Co.
Thos. Edison, Inc.
Electric Industrial Truck Assn.
Electric Products
Electric Storage Battery Co.
Elizabeth Iron Works
Elwell Parker Electric Co.
Equipment Mfg., Inc.

Fab-Weld Corp.
Fairbanks Co.
Faultless Caster Corp.
Harry J. Ferguson Co., Inc.

General Box Co.
General Electric Co.
Geneva Metal Wheel Co.

A. J. Gerrard & Co.
Gerrard Steel Strapping Co.
Globe Hoist Co.
Gould Storage Battery Corp.
J. W. Greer Co.

Harnischfeger Corp.
W. F. Hebard & Co.
Hertner Electric Co.
J. R. Hooper Co.
Frank G. Hough Co.
Hyster Co.

Industrial Pallet Co., Inc.
Industrial Washing Machine Corp., Pallet Division
Insley Mfg. Co.
Ironbound Box & Lumber Co.
Island Equipment Corp.

Joyce-Gridland Co.

Keen Mfg. Corp.
King Sales & Equipment Co.

Lanham Co.
Lawrence Pallet Exchange
G. B. Lewis Co.
Lewis Shepard Products, Inc.
Lift Truck & Portable Elevators Manufacturers Assn.
LYON-Raymond Corp.

Magnesium Co. of America
Mansaver Industries, Inc.
Marsh Stencil Machine Co.
Material Handling & Power Transmission
Material Handling Institute
Material Movement Industries
Mathews Conveyor Co.
May Fran Engineering, Inc.
Meese, Inc.
Mercury Mfg. Co.
Merrill Brothers
Mobilift Corp.
Monroe Auto Equipment Co.
Morrison Co.
Motor Generator Corp.
Moto-Truc Co.

National Metal Edge Box
National Pallet Corp.
National Wooden Box Assn.
Nook and O'Neill, Inc.
Nutting Truck and Caster Co.

Ohio Equipment Co., Inc.
Orangeville Mfg. Co.
Otis Elevator Co.
Ozark Pallet Co.

Pallets, Inc.
Pallet Sales Corp.
Pallet Systems, Inc.
Patron Transmission Co., Inc.
Pittsburgh Steel Products Co.
Powell Pressed Steel Co.
Production Aids, Inc.

Rack Engineering Co.
Rapids-Standard Co., Inc.
Ready-Power Co.
Re-Bo Mfg. Co., Inc.
Revolvator Co.
Richards-Wilcox Mfg. Co.
Robbins & Meyers, Inc.
Ross Carrier Co.
Rotary Lift Co.

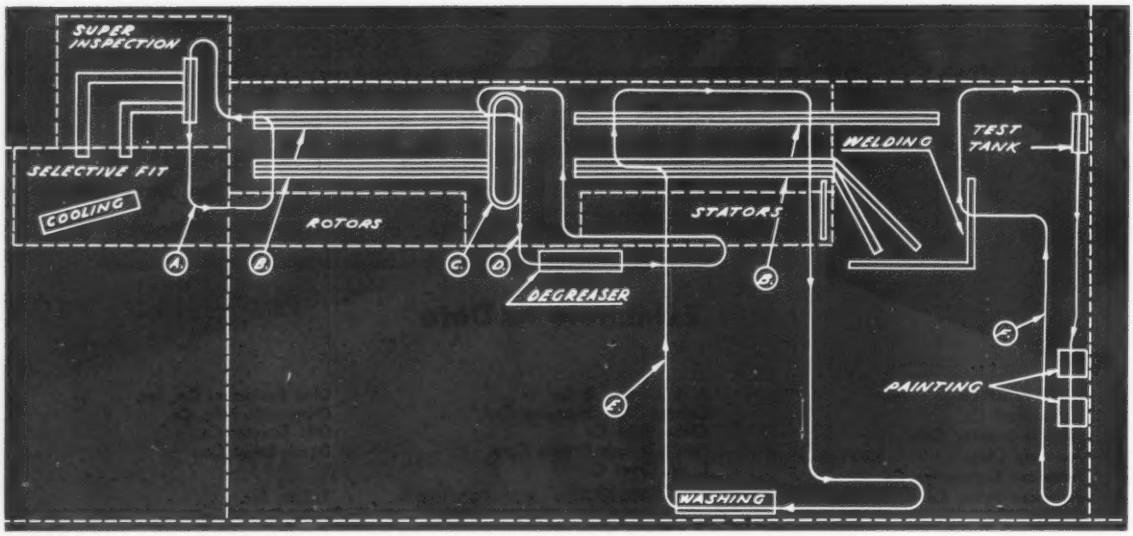
Sabin Machine Co.
Saginaw Products Corp.
Schwitzer-Cummins Co.
Service Caster & Truck Corp.
Sherman Paper Products Corp.
Signode Steel Strapping Co.
Silent Hoist & Crane Co., Inc.
Sisalkraft Co.
Skarnes Engineering & Supply Co.
Smith Power Transmission Co.
Speedways Conveyors, Inc.
Standard Conveyor Co.
Stanley Works
Steel-Parts Mfg. Co.
Sterling Bolt Co.
Stratton Equipment Co.

Thermoid Rubber
Thew Shovel Co.
Thomas Truck & Caster Co.
Towmotor Corp.
Transitier Truck Co.
Truck-Man, Inc.
Truscon Steel Co.

Union Metal Mfg. Co.
Unistrut Products Co.

Waterman Engineering Co.
Jervis B. Webb Co.
West Bend Equipment Corp.
Westinghouse Electric Corp.
Whiting Corp.
Whitney Chain & Mfg. Co.
Williford Mfg. Co.
Wirebound Box Mfrs. Assn.

Yale & Towne Mfg. Co.



LAYOUT. The article discusses in detail the on-the-floor and overhead conveyors shown in above drawing.

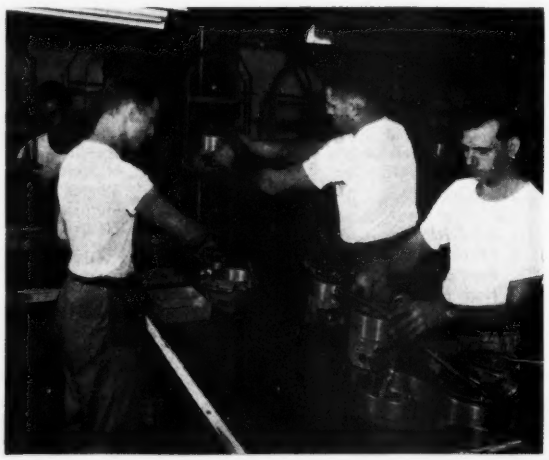
SMALL LAYOUT... BIG VOLUME

More refrigeration compressors are assembled on this progressive line because overhead space is used for parts-feeder conveyors. Handling methods in this compact, high-volume operation are applicable to many other products.

OVERHEAD CHAIN AND GRAVITY ROLLER CONVEYORS, PALLET-FORK-TRUCK METHOD, STEEL STRAPPING

THE Tecumseh Products Co., Tecumseh, Mich., employs 2,000 people and covers more than 300,000 square feet of floor area, but a few years ago it was only a fraction of its present size. The firm manufactures refrigeration compressors and condensing units for use in domestic and light commercial equipment. Today the Tecumseh Products Company produces an important percentage of the industry's total annual volume of refrigeration compressors.

The firm did not enter the field until a mere 13 years ago, in the fall of 1934, when the original plant covered just under 50,000 square feet. A small group of refrigeration engineers had pooled their know-how and decided to go into belt-driven compressors. The men, R. W. Herrick, president; F. K. Smith, sales manager, and C. M. Brown, general manager, refrigeration division, had their full quota of headaches. The depression period from



TO ASSEMBLY. Crank cases and parts are placed on conveyor trays in selective fitting room,

1934 to '38 didn't simplify the difficulties of a financial and business nature. These obstacles were aggravated by the further problem of training help drawn from rural areas. (The population of Tecumseh is 3500.) Yet, the organization grew during nine successive plant additions that were made beginning in 1937.

The most recent addition of 60,000 square feet, now nearing completion, brings the plant's total square footage to 312,620. Since 1941, unit production of compressors has increased 100 per cent. The present plant expansion will be used in part for operating areas in connection with the mechanized assembly line for compressors, in which the company specializes. This description covers the assembly of the internally mounted hermetic compressors, made in capacities of 1/8, 1/6 and 1/5 horsepower.

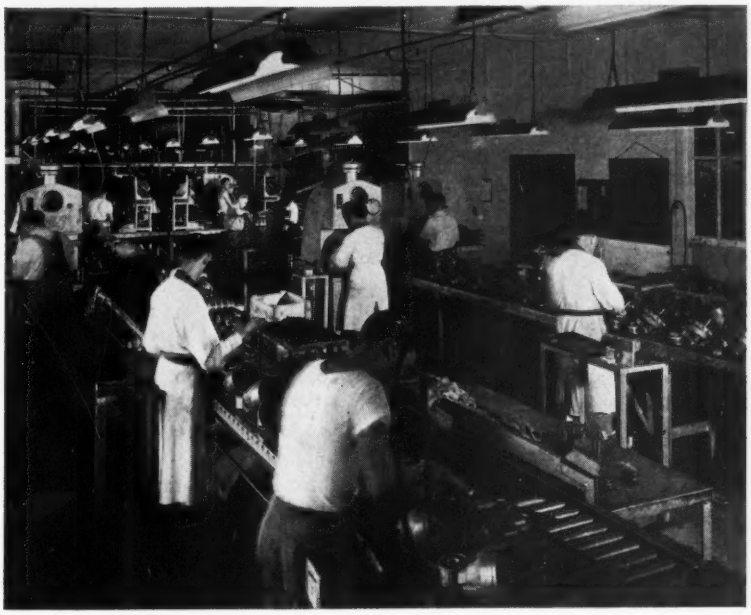
"Air Rights" Multiply Square Footage

In the interest of low unit-cost production, material handling procedures had to keep pace with the constantly growing volume. Several years ago, following another production jump, the time-honored assembly method on stationary benches was found inadequate. The compressors were slid during assembly over steel tables from station to station. Operators did too much walking in relation to actual assembly time. In supplying the components, much carrying and other physical effort was necessary. And floor areas were jammed with waiting parts and completed products. The operation was taken off the floor and off the tables with the installation of a conveyorized assembly line, shown in the accompanying flow diagram. The resultant straight-line flow permitted a more efficient grouping of operations, and maximum production per square foot of manufacturing space was obtained. The system of overhead chain conveyors, tied in with the assembly line, utilizes head room that could not be used previously.

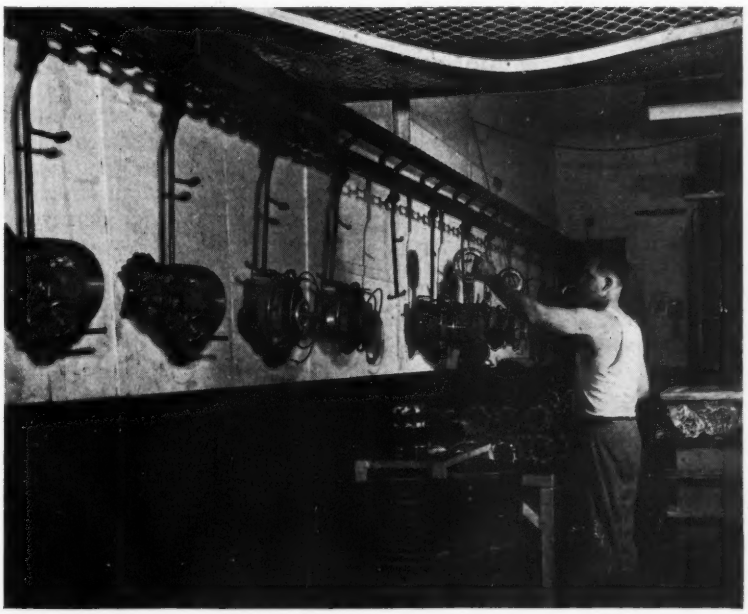
Several thousand hermetic (and other) compressors are assembled daily on the mechanized line, which takes up an area no greater than 30 by 200 feet. This gives an idea of volume output in compact space (an important achievement in a plant that has for years been suffering from growing pains).

The completed compressors weigh between 40 and 60 pounds each, averaging about 11½ inches in diameter. The flow during assembly is from north to south, with the overhead chain conveyors feeding components from stock rooms and certain processing operations located to the west of the line. The overhead conveyors have a combined length of 865 lineal feet (including the spray painting line). They travel at the rate of 15 F. P. M., each line being driven by a ¾ horsepower motor and designed for an hourly capacity of 600 units. All tray and hook-type carriers are mounted on the chains at 18-inch centers.

In the machine room, north of



▲ **THREE LANES.** Two outside ones are used for assembly, center one for return of empty pallets.



▼ **MORE COMPONENTS.** Stators being added on small hook of "F" adapter in the stator stockroom.

the assembly line, the flow is likewise south, with crank cases in the center of the room, smaller parts on the east and west sides. These components converge on (1) the degreasing station and (2) the conveyorized dryer oven, which are located between the two departments. The degreased crank cases are placed on pivoted wire mesh shelves for drying, while the smaller pieces are carried through the oven in wire baskets placed on these same trays. From the discharge end of the dryer, the components are fed via a metal chute into the selective fitting and inspection room, where all internal parts are selectively fitted to the crank cases. As can be seen from the flow diagram, the fitting and inspection tables in this room form a "V", and the first chain conveyor circles over the end point. This line is indicated by A on the diagram.

PALLETIZING AREA. The completed compressors are made up into load units for truck shipments. Cover photo shows application of steel strapping.

Suspended from the chain are 10″ x 10″ double-tray carriers, the trays mounted eight inches apart vertically on adapters made of 1½″ x 3/16″ strap iron. The length of this closed circuit is 115 feet. The metal trays are padded with corrugated cardboard to protect the machined surfaces of the parts being conveyed.

The operators deposit the fitted components on the trays, which are approximately at chest height. The west-traveling line passes through a wall opening into a stock room where the motor rotors are added. The line then makes a 90-degree turn and enters the air-conditioned compressor assembly room. Reference to the flow diagram shows that the conveyor circles over the head end of two parallel (gravity roller) assembly lines—B. Thus Conveyor A ties in the assembly department with the selective fitting and inspection room, located to the north, and with the rotor loading station, located to the west.

The operators at the start of the gravity roller assembly line remove the arriving components from the traveling trays and place them on 12″ x 8″ cast iron pallets that ride the rollers. Note the photo shown of this operation. Each assembly conveyor consists of a three-lane roller bed, each 12″ wide with the rollers mounted on 4-inch centers. Assembly proceeds on the two outside lanes, while the empty pallets are returned to the start of assembly on the center lane. Different models or sizes of compressors can of course be run simultaneously on the two main parallel conveyors, which are eight feet apart. The description of the hermetic compressors is typical of the entire operation and therefore applies to any model produced.

A slight push sends the cast iron pallets with their components from station to station. The relatively small parts—cap screws, belts, washers, etc.—are supplied on trays located over the center gravity lane, which makes the supplies equally accessible to operators on both sides. Occasionally, where necessary for reasons of convenient assembly, small tote pans with parts are attached to the conveyor channels. Air wrenches are used for all tightening operations.

A press is located (on each side) near the end of the first section of the assembly Line B. Here the rotor is pressed on the shaft and the original assembly of the suction tube is also started. (This is one of few times that the assembly is lifted off the line during the operation.) The unit is then replaced on its pallet, and the next assembly station is the end point of the first section of Line B. Note the oval conveyor indicated at this point.

From the end point of the first section of Line B, the compressors are placed on pallets that ride the oval Line C. Meanwhile the empty pallets on Conveyor B are returned to the start on its center lane. As can be seen from the sketch, the oval gravity (test) conveyor receives the units from both longitudinal lines of B. Six testing stations are in the oval.

Reference to the flow sheet shows that this testing station is circled by overhead Conveyor D, next in line. This is a continuous circuit 118 feet in length. Upon completion of the volumetric test, the assemblies are hung on the lower prongs of the twin-hook carriers, which resemble an inverted F (see photos). The units are carried west through a wall opening and, after a 90-degree turn, through an enclosed degreasing and drying system. About 35 feet beyond this station, the line makes a 180-degree turn to enter another stockroom. Here the stator is hung on the small hook of the inverted F. The tip of this hook is rubber-covered to protect the stator wiring. Beyond this stockroom, the line's direction of travel is east, and it reenters the assembly room just south of the volumetric efficiency testing stations. Here the components are taken off and deposited on the second section of Conveyor B. The progressive assembly continues with the pressing in of the stator.

A few summary observations at this point will be in place. It will have been noticed that the outbound line of D serves a processing operation (degreasing), while the return line (passing through the stator room) serves a feeder or supply function. The line also makes possible rectangular space

utilization, and during its overhead travel the floor areas, whether aisleways or assembly areas, are kept free for necessary functions. At the same time the delivery of the scheduled quantity of parts to assembly is maintained in a continuous flow.

Overhead Conveyor E, a section of which travels above D, maintains a flow of shells or housings to the build line, and is 340 feet long. In this area several smaller component parts are added to the assembly, which is then placed in the bottom shell. If the shell has flat legs, incidentally, the unit can ride on the closely spaced rollers, without pallets, since the machined surfaces are now protected by the enclosure. After some wiring operations, the top shells, fed from a mezzanine section, are added.

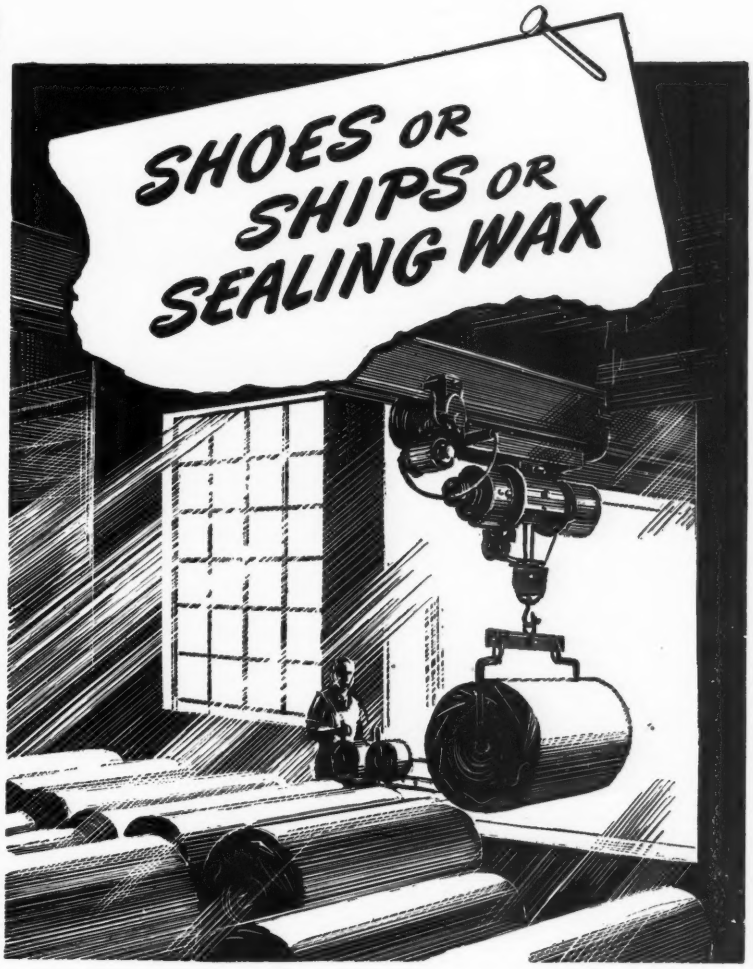
As the unit approaches the end of Line B, it is, except for a few small parts, a complete compressor. The line extends through a wall opening into the welding department. Here several gravity conveyor sections branch out to automatic welding machines, where the top and bottom shells are welded together with a leakproof weld.

The welded compressors are routed under overhead chain Conveyor F, the last one in this area, which is 230 feet long. Hung on swivel hooks, the units are now conveyed successively through the test tank and, after passing a drying station, through paint spray booths.

The unloading point on Line F is near the loading station. As the compressors are taken off they are routed over a three-lane radial chute for loading on racks and subsequent movement to the dehydration ovens, then to final assembly, testing and shipping. (Certain types of compressors that are assembled into complete refrigeration systems — with evaporators and condensers—are carried by another chain conveyor, not shown, to the far south end of the plant for unit assembly.)

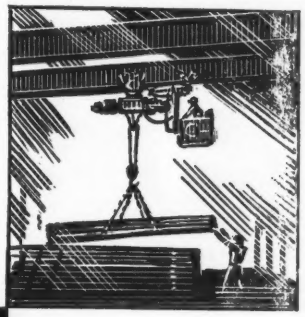
While the dehydration ovens are in a straight line south of the assembly area, the final assembly and testing operations extend east from the ovens and end in the shipping room. Thus the flow is actually L-shaped.

(Turn to page 69)



Regardless of what you make, it's safe to assume you have the problem of lifting, moving and depositing raw materials, semi-finished or finished products. Where such loads involve weights from 1/8 to 20 tons and where they must be handled smoothly, easily, economically and efficiently, consider the advantages of Shepard Niles hoists.

America's oldest builder of electric hoists and cranes offers you more than 5,000 styles and sizes from which to make your selection. Without obligation on your part, trained, experienced Shepard Niles engineers will study your requirements and recommend the hoist most suitable for the job.



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Moving heavy loads, indoors or out, is no job for human muscles or inefficient handling equipment. If you want to extend your improvements in shop practice to material handling, ask Shepard Niles engineers to assist you in selecting the electric crane to handle your loads with speed, safety and economy.

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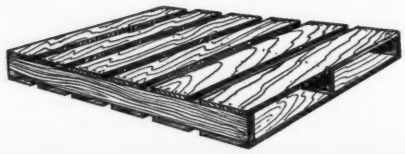
ON THE  PALLET

NEWS · VIEWS · TRENDS

DECEMBER 15 is the deadline for entries in the $1500 FLOW contest. There is still time to obtain an entry blank. Prizes will be paid for the best papers dealing with cost reduction in receiving, packaging, processing, assembly, fabrication or stock keeping through the use of proper material handling methods. Manuscripts may describe the costs factors for an entire plant or a single department.

HOURLY labor charges have been revised since the issuance of the National Material Handling Exposition Exhibitors Manual. Public Auditorium officials announced rates as follows: Carpenters, $2.50; Painters, $2.50, and Unskilled Labor, $1.50. These rates are for straight time. Overtime is charged at double these figures.

W. GIBSON CAREY, JR., 51-year-old president of Yale & Towne Manufacturing Co., was accidentally drowned, October 4, 1947, while swimming at Ponte Vedra Beach, Fla., where he was attending the semi-annual meeting of the American Society of Sales Executives.

W. Gibson Carey, Jr.

Carey served as president of the company for 15 years. He had joined the Yale & Towne in 1929 as a director and later was named assistant to the president.

Born in Schenectady, N. Y., July 3, 1896, he rose to a place among the nation's top executives. As an articulate champion of "free enterprise and individual opportunity", he served as president of U. S. Chamber of Commerce in 1939-40. A director of the National Industrial Conference Board, was board chairman at the time of his death.

His business interests ranged over a wide scope. Among them, at the time of his death, he served as trustee of Mutual Life Insurance Co. of New York, and Consolidated Edison Co. of New York, Inc., and a director of the Irving Trust Co., Colgate-Palmolive-Peet Co., New York Telephone Co., Armstrong Cork Co., and Research Corp.

A RECENT survey of material handling practices in 25 cities disclosed that break-even points for many industrial plants had risen from a pre-war level of 47 percent of capacity operations to 67 percent of capacity. In one case, the sales volume for a metal plant now has to reach more than 50 million dollars annually in order to attain profit levels formerly reached at a 10 million dollar sales volume, according to Samuel W. Gibb, president of the Material Handling Institute, which made the study.

C & D BATTERY CO., sales outlet, and Carlile and Doughty, Inc., have combined and are now operating under the name of C & D Batteries, Inc. The company is located in Conshohocken, Pa.

OFFICERS of the newly-formed Northeastern Ohio chapter of the Materials Handling Institute have been announced as follows: Earl F. Riter, supervisor of the production control department, Glidden Co., president; George McManus, Thompson Products, Inc., vice president; R. M. Slife, Nook and O'Neill, Inc., secretary, and R. N. Stevenson, Lamson and Sessions Co., treasurer.

The purpose of the organization is to furnish educational material to all industries for lower unit cost production by use of up-to-date handling methods, and to develop a clearing house for exchange of ideas on all phases of material handling. The organization is to be made up of 75 percent user members and 25 percent manufacturer and distributor members.

The membership committee is: D. W. Filkins, Towmotor Corp., chairman; E. M. Abramson, Ohio Equipment Co., H. C. Morrison, Morrison Co., all of Cleveland, and J. H. Hobbs, Pittsburgh Plate Glass Co., Barberton, O.

WIREBOUND shipping container manufacturers are expecting to end 1947 with almost record breaking box and crate production. L. S. Beale, secretary of the Wirebound Box Manufacturers Assn., has reported surface-footage volume for the industry during the first seven months of the year as 37.6 percent over the same period in 1946. He added that the volume for the year Aug. 1, 1946, through July, 1947, was 32.8 percent over that of the preceding 12 months. The shortages of wire and veneer have reportedly eased, assuring maintenance of high quality standards of production.

NYLON is now being used for transverse cord breakers in conveyor belts for higher tensile

(Turn to page 77)

Saves 750 lbs. dunnage per car

Water heater company cuts freight costs, reduces damage claims, saves time and labor with Acme Steelstrap

The extra expense of material and labor for bracing a car with heavy, costly lumber is a cost of distribution which can be reduced. Also, that hidden cost, "claims for damages," can be eliminated.

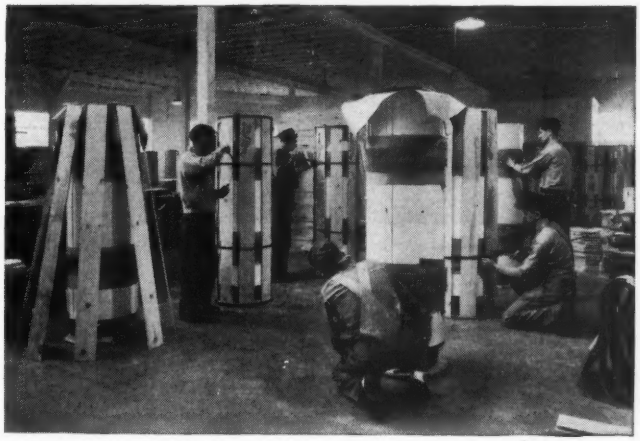
The Fowler Manufacturing Co. of Oregon asked Acme shipping specialists if Acme Unit-Load Band might be an answer to their water heater shipping problems. It was. This method saves 750 lbs. of lumber dunnage per carload and has proved to be a safer method of bracing cars.

While there, the Acme experts also suggested an improved design for individual heater packages. This resulted in another 25% savings.

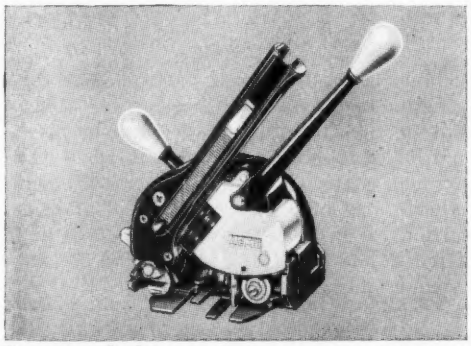
You are welcome to call in an Acme shipping specialist to consult with your organization on any shipping problem without obligation.

Write or send for booklet containing actual case histories of substantial savings made by Acme shipping specialists.

Acme Unit-Load Band practically eliminated freight damage claims, reduced labor costs, and saved 750 lbs. of lumber dunnage per carload.



A shipping room production line is building more efficient packages with Acme Steelstrap. This saves 25% on each water heater package.



More savings ahead for Acme Steelstrap users—No. 3 Steelstrapper, the lightest tool made, is now available. Magazine holds 100 seals. Tensions, seals, and cuts the strap in one operation. Small base requires only 5-inch strapping surface. Two levers working in opposite directions make for better balance and easier handling.

Acme Steel Company, Dept. F-117
2838 Archer Avenue
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Gentlemen:

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

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ACME STEEL CO.
CHICAGO

FORK TRUCK, PALLETS, HOISTS

MUSCLE POWER: But it could move only 150-lb. loads. This was the old handling method. Patterns, right, once oblong, are now made round.

STEEL MUSCLES: Now loads up to two tons of grindstones are stacked high, without effort.

SHARPER Performance

With the fork - truck - pallet method adopted for its grindstone plant, this company has engineered outstanding production and handling improvements. The work flow is speeded through departmental layouts by clever adaptations of electric hoists and chain falls to receiving and some fabricating functions. Multiple grinding is another innovation—in an industry where the wheelbarrow has been the traditional load mover.

UNTIL recently, in grindstone manufacture a man's strength of muscle used to set the limit to the size of the loads that could be moved between fabricating, storage and loading operations. A wheelbarrow was the prime load carrier, and the maximum weight of individual loads was usually around 150 pounds. The patterns (or blanks) were loaded from the stockpile on the wheelbarrow and thus successively advanced to drilling, grinding, storage and thence for loading into outbound cars. Not only was the stone moved in small quantities, but much time was consumed in the handling of the individual pieces, as in storage. The grindstones were hand-piled one by one from the wheelbarrow to the stockpile; later. the piece-by-piece handling was repeated when the material was transported to freight car or highway truck. In fabricating, too, the one-by-one method was the rule. In grinding, for example, an operator used to hold one stone on a bar, finishing each one singly. That was the old way.

In contrast to this cumbersome method, the Cleveland Quarries Co. is transporting small-diameter grindstones between the operations indicated above in loads averaging 1½ tons. Muscle power is no longer a factor. And, because of mechanical handling, the pallet loads

are stacked to a height of 12 feet, (to the top of the load), resulting in space economy. This, briefly, is the significance of the modernization project carried out within recent months by the company in its small grindstone plant.

The impetus for the improvement project was furnished by a stepped-up production program, which contemplated a 300 per cent volume increase. The first step was to remove the old grindstone department from a section of another plant and establish it in a building of its own. The present plant is actually a separate room in a recently expanded building. (The latter is located on an 800-acre property in Amherst, Ohio, where the company is working the largest sandstone deposits known.)

Efficient layout and mechanical handling received proper consideration in the original planning. The plant area is just below 5,000 square feet, and the flow is U-shaped in the rectangular space. The moves between successive stations are short and the work advances in a straight-line flow. Receiving and fabricating take place in one longitudinal section and in the short lateral section of the U, while storage of the finished products is maintained in the second longitudinal area. The freight car loading door is a short distance to the rear (east) of the layout, keeping maximum runs of the fork truck during loading within 125 feet.

Fork Truck and Hoists

An explanatory word will be in place about the small grindstone department. The small stones are only one of the two main types produced, the other one being those of large diameter. These range in size from 24″ x 3″ up to 72″ x 18″. The heavier of these units weighs up to 3,500 pounds each and are produced in a separate plant, where the handling is entirely by traveling bridge crane. Another variety, not concerned here, includes both sizes and is the mounted type. It is the small grindstones. the subject of this description, for which the palletization program was adopted. The diameters of the small stones range from 5″ x 1½″ up to 24″ x 2½″. These items are used by a variety of industries and are fabricated and shipped regularly in carlot quantities.

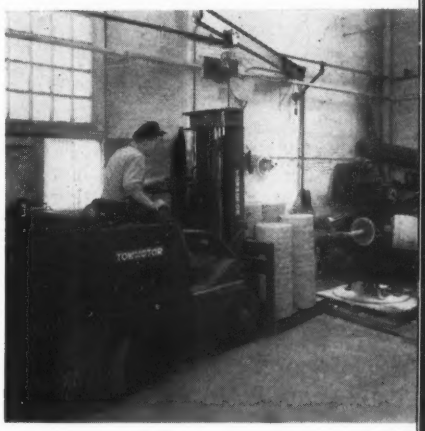
The circular patterns are produced on presses in a saw mill, and the roughs are transported in three-walled boxes by highway truck the half-mile distance to the small grindstone plant. The boxes, double decked for transport, are equipped with clevises on the four corners, which permits them to be loaded by crane in the mill. The dimensions of the containers are 5′ long, 3′6″ wide, and 1′6″ high.

The loaded truck backs into the plant, where the fork truck picks off the boxes and stacks them in the receiving area. As the unloading progresses, some of the boxes are usually beyond the reach of the truck forks. A glance at the "receiving" photo shows the arrangement that obviates any difficulties in this respect. Note that the delivery truck stops under a hoist operating on a jib that is attached to a post at a height of 12 feet above floor level. This one-ton electric hoist spots the boxes within reach of the fork truck, which is of 5000-pound capacity.

The patterns enter the plant at the west and flow east, then, following the U-shaped layout, south during final fabrication, and from here west into storage.

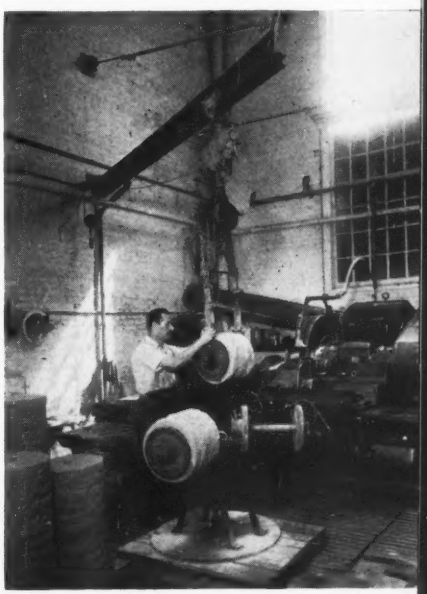
When needed for drilling, the fork truck spots the full boxes at the several machines, where the "eyes" or center holes are drilled. Ease of operation and economy of motion are considered in spotting the boxes of rough patterns at the work stations. The loads are placed at one side, within convenient reach of the operators, on stands that keep the work at waist height. The pallets, which will receive the

(Turn to page 62)



PALLET LOADS IN FABRICATION: These drilled patterns are spotted by truck for the grinding operation, above.

PATTERNS COME IN: Electric jib hoist spots full boxes on vehicle when they are beyond reach of forks.



MULTIPLE GRINDING: Note chain fall suspended from electric hoist. Loading jig, foreground.

Is Protection of finish one of y handling problems?

The finish on die cast components for automobile grille assemblies is protected with this handling:

1. While in rough form in strapped load units.
2. In finishing and processing, on overhead chain conveyors.
3. In electroplating, by electric hoist handling.
4. In assembly, by use of belt conveyors.
5. The assembled units are shipped in collapsible pallet boxes of clever design.

Results:

A *damage and rework are at a minimum.*

B *high production schedules are easily maintained.*

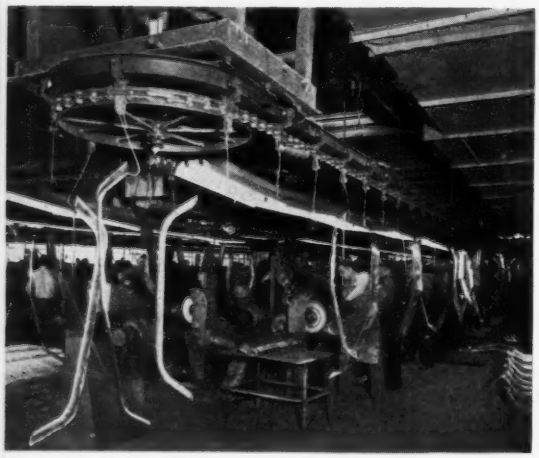
350 PER LOAD. This is typical tray pack method of shipping the rough die cast bars.

KNOWN as one of the country's five largest producers and finishers of die castings, the Gerity-Michigan Corp. operates three plants. One, in Detroit, is devoted to die casting, and two in Adrian, Michigan, exclusively to electroplating and other forms of finishing. Of the latter two, the 74,000 square foot Beecher Street plant specializes in automotive parts.

Of particular interest in the Beecher Street plant are grille bars which are both finished and assembled for a popular make of passenger automobile. Five different kinds of these bars, together with smaller parts, make up a complete automobile grille weighing 39 pounds. The individual bars weigh up to nine pounds and range in length from 34 to 54 inches.

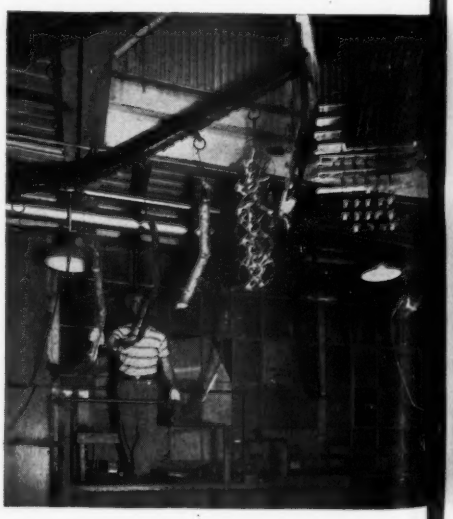
Odd Shaped Items—Nice Handling

The bright surface imparted to die castings makes for sales appeal —"the finish is the salesman." The finish must be without a flaw—nicking and scratching of the mate-



RAW BUFFING. Overhead conveyor circles buffing machines, delivers bars to inspection. ◀

TRANSFER. From degreaser line, foreground, bars are hung on line in rear for delivery to the plating department. ▶



of your

FORK TRUCKS, SKIDS, STEEL STRAPPING, CHAIN AND BELT CONVEYORS, ELECTRIC HOISTS

rial must be avoided, and this means "handling with care." And from the standpoint of efficiency and economy in production, individual piece handling must be avoided wherever possible.

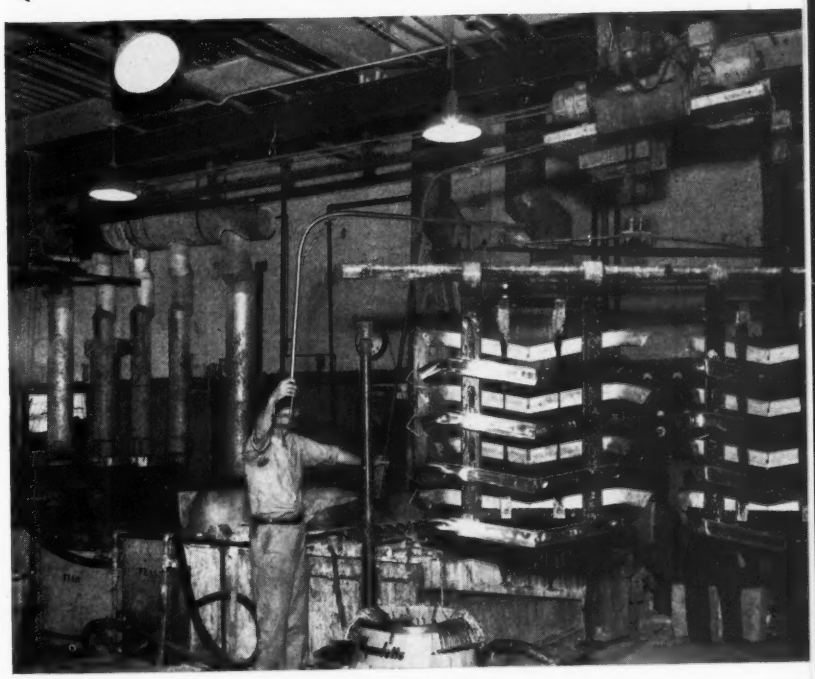
The methods developed by Gerity engineers meet these two main requirements to an outstanding degree. This can be observed in the handling of the bars during receiving, buffing, degreasing, electroplating, spraying, assembly, and finally in the shipping of the completed grilles.

The rough bars arrive in strapped load units from the Gerity die casting plant in Detroit, built up to seven layers high by use of tray separators. The base of the load is a low-slung wood skid (39″ x 58″) with a seven-inch underclearance. The total number of pieces per skid ranges from 133 of the largest bars to 350 of the smallest size.

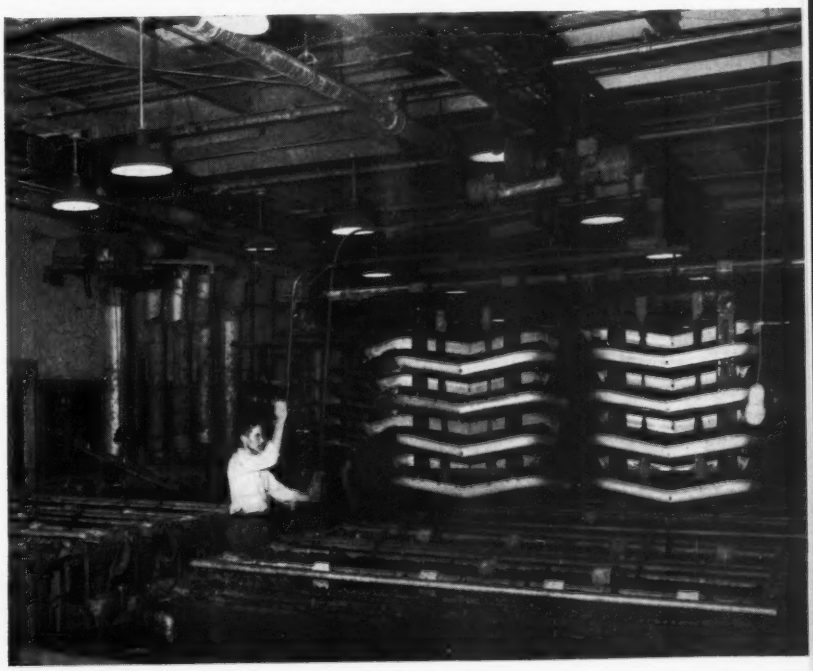
Considerable ingenuity is evident in the packing of these items, which have an uneven contour due to projections. The shape of several resembles that of a broad "V". Pieces of this latter design are packed in a reversed pattern in each layer. That is, each alternate bar is reversed so that once the point of the "V" is up, once down, resulting in an interlocking pattern. A two-inch wood strip is placed between the ends of the bars along the length of the skid on each side. These wood inserts serve two purposes. They fill the gaps between the reversed ends of the

LOADING FOR DIPPING. Plating racks are suspended from work bar. Work arrives in recess at rear, right. ▶

HOIST HANDLING. Two racks loaded with 16 grille bars are lifted by hoist to start of plating cycle. ◀



HOIST DIPPING. With push-button-controlled hoists two racks at a time are advanced through the electroplating tanks.



bars, making for stability, and thus also prevent friction between metal surfaces in transit, which would result in scratches.

ASSEMBLY. Top belt conveyor, right, is for sub-assemblies, lower one for completed grilles.

For steel strapping purposes, two pieces of 2x4 lumber are laid lengthwise and two pieces crosswise on top of the load, in the order named. The lumber is notched at the ends to accommodate the bands of 7/8" strapping which is used, resulting in a rigid load.

While there are variations in the packing pattern as determined by the contours of the different types of bars, the case described is typical of the "quantity" packing and shipping method evolved. From the incoming trailers the loads are picked off by a 3000-pound fork truck and moved to the receiving-inspection area which adjoins the truck dock. A dozen or so tray packs usually make up a trailer load, which is unloaded by the fork truck operator in 20 minutes. The returning vehicles usually take back a load of skids and trays to Detroit. It is a simple matter to appreciate the efficiency of the present method when one recalls that once these bars were shipped in small cartons, seven or eight pieces to the container.

In the Detroit bar and grille department the packing operators are on a wage incentive basis. Workers can increase their base pay up to 30 per cent through a proportionate output above the set standard. When operating at capacity, the Beecher Street plant in Adrian uses more than 5,000 bars per day, and the wage incentive in Detroit assures that a sufficient stock will be on hand at all times.

Maintaining the Finish

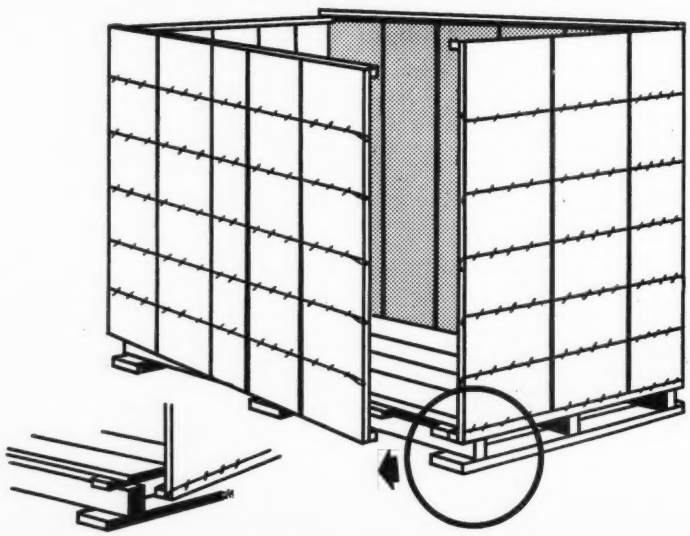
In the receiving area, the bars are inspected for proper contour, tap holes, possible casting defects and other points. The approved pieces are sent on castered rack trucks over a short distance to the raw buff department, which is circled by an overhead chain conveyor. The truckers distribute the bars according to kind to the several buffing stations.

After completion of the finish buff (on powered machines designed by the company), the bars are hung on the overhead chain conveyor in whose oval circuit, 218 feet long, the batteries or buffing machines are set up. Driven by a 1/2 horsepower motor, the line travels at the rate of 20 F. P. M. and the adapter hooks are spaced on 18" centers.

At the south end of the oval circuit is an inspection-transfer station. Pieces that are not passed are replaced on the conveyor for buff repair. The approved bars are transferred by the inspectors to another chain conveyor, which inclines beyond this point and carries the material through an overhead degreaser. The return strand of the degreaser line emerges from the enclosed system 35 feet west of the loading point, traveling close to the ceiling.

At the junction point of the return strand and another overhead conveyor (the latter travels west), an operator stands on a platform elevated five feet above floor level. He removes the arriving buffed and degreased bars and hangs them on the other conveyor for delivery to the plating department. (The degreaser conveyor also carries many types of smaller automotive parts, which continue their travel to an adjoining room where they are

BOX DETAIL. Drawing shows how cleat on end wall fits into opening at end, how sidewalls rest on projecting supports.



racked for plating.)

In the plating department for grille bars, the incoming conveyor line dips in a recessed space that is in a central position to the plating tanks extending north and south in the area. The tanks for copper and zinc plating are in the north portion, while the chrome plating tanks occupy the south part of the longitudinal space.

The tanks in the north section of the room are covered by an overhead oval track, 150 lineal feet, on which five one-ton electric hoists advance the bars through the plating cycle. In the south end, hoists similarly perform all handling tasks in connection with chrome plating.

The incoming pieces are inspected once more. Those not approved are marked with a red crayon and are returned on the conveyor for buff repair. The other bars are laid across a table and studs are then inserted for racking purposes in the two holes at the ends. One plug is inserted in the center to prevent this part from becoming filled with plating metal.

The prepared bars are placed by the inspectors on a stand at the foot end of the table, adjacent to the racking station. As can be seen from one of the photos, the plating racks are suspended from work rods, which have a "V" lug at each end. At the start of the cycle, the 10-foot-long work rod is placed by hoist on the stationary stand.

One operator hands the bars to the two rackers, who work simultaneously on both sides of the 29" x 45" racks, which are made of 1/4" copper stock four inches wide. Each rack has four sets of contact points on each side, approximately 10 inches apart, which gives a capacity of eight bars per rack. Since the work rods are made to accommodate two racks each, the maximum load per rod is 16 bars. The hoist operator at this end of the room picks up the loaded work rod, nimbly manipulating the load by use of both hands. In his left hand he has the electric hoist control, pushing the buttons for travel, hoisting or lowering. With his right hand he has hold of the handle which is at the end of the extension arm attached to the spreader bar. While the hoists perform all tasks electrically, the extension arm is used for guiding the spreader bar

RECEIVING TO STORAGE
STORAGE TO PRODUCTION
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You can count on Clark Tructractor to "steal the show" as it did in '47 with sound, practical, new ideas for cutting handling costs. Both gas-powered and battery-powered fork-lift trucks and towing tractors, together with attachments—products of Clark's traditional quality, versatility and leadership.
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AND INDUSTRIAL
TOWING TRACTORS

BAKER TRUCKS cut Pulp-Handling costs at Nekoosa-Edwards Paper Mills

How Baker Lift Trucks and skids can cut costs of handling heavy, bulky material is demonstrated in the two mills of The Nekoosa-Edwards Paper Company at Nekoosa and Port Edwards, Wis. Pictures and captions tell the story.

Incoming materials such as bagged starch are unloaded with Baker Low-Lift Trucks. Bags are placed on skids in the cars, and skid loads carried to beaters on the trucks. Surplus stock is stored on skids.

At the deckers, wet laps of pulp are folded and piled on skid platforms. Truck keeps deckers supplied with empties and picks up loaded skids, transporting them to scales for weighing, and then to temporary storage.

Wet laps remain on skids in temporary storage until delivery to beaters. About 1850 standard 36"x60" metal platform skids are in use in both mills. Unit loads average about 3600 lbs. wet weight.

Three deckers in the two mills produce about 365 skid loads per day. When temporary storage cannot accomodate stock on skids, Hy-Lift Trucks do the heavy lifting for high piling — wet pulp being too soft for tiering.

Wet-lap pulp on skids is interchanged between the two mills — four miles apart — by the company's own railroad. Box cars accomodate 20 skid-loads per trip. Loading and unloading is completely mechanized by Lift Trucks available at both mills.

Truck operators are held responsible for keeping the 26 beaters at both mills supplied with skid loads of wet-lap pulp—also for removing empties, returning them to deckers, and removing pulp from deckers to keep production moving.

Baker Trucks at Nekoosa-Edwards are up to 18 years old—and still going strong!

See us at Booth 303
Materials Handling Exposition
Cleveland, January 12-16

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*
2185 WEST 25th STREET • CLEVELAND, OHIO

in engaging or releasing the work rods.

The tanks in the north end are arranged in two rows on both sides of the department. Each of the five operators stationed here is assigned to specific tanks.

The first operator in line immerses the racks successively in cleaning and rinse baths, then in the copper strike tank. Operator No. Two advances the grille bars through the next tanks. No. Three hoists the rods from here and deposits them in one of eight positions in the copper plating tank. This completes the series of tanks on the east of this section of the department. No. Four Hoist Operator moves the loads to the rinse tanks on the west side of the area. From here, No. Five Operator deposits the bars in one of the 12 positions in the nickel plating tanks. When he has placed a rod, he next removes a rod and delivers it to the unloading point (across the room from the inspection station). Two women operators are seated on a platform and maintain records.

If a hoist went temporarily out of order, would it interfere with the progression of the work through the cycle? No. Here's why. At the north end of the oval track is a short spur with a pull switch. A hoist requiring repair is shunted on this spur, and a reserve unit is put in operation.

At the end of the cycle, the bars are unracked and given a visual inspection. If satisfactory, they are hung on a chain conveyor for transfer to the racking station in the chrome plating end of the room. Here the bars are placed on the same kind of racks and, as stated before, hoist handled similarly to the method just described.

Hoist handling, it will have been seen, is well adapted to these relatively large and variously shaped items. The same method and equipment would of course be suitable for other large-size types of material requiring safe and rapid handling in multi-unit loads. Rack designs, it was pointed out by Gerity engineers, can easily be changed to new product requirements.

The chrome plated bars are unracked and placed on an overhead chain conveyor circling past the unloading point. (When necessary, inspectors buff any pieces requiring it.) As the bars start on this

line through an S-shaped layout in the west side of the room, the racking studs are removed by one operator. The conveyor enters a spray booth, where the backs of the bars are sprayed with a quick-drying enamel. Next comes an infra-red drying oven, then another inspection station where the plated surfaces of the traveling bars are wiped with cloths. (The painstaking care given to the matter of a perfect finish is evident.)

The conveyor now travels north to the far end of the room where a series of assembly benches is set up parallel to belt lines. As the bars enter the area, an operator attaches the spacers. The units are then removed from the line and stored in separate stacks (according to the type of bar) in a row parallel to the assembly benches.

The top and bottom bars are first built into a subassembly, and at this point an explanation of the belt lines is necessary. There are two 34-inch endless canvas belts 27 feet long, one installed above the other on the same supporting frame, each line driven by a ½ horsepower motor. The height of the lower belt is 34 inches from the floor, that of the top belt 55 inches from the floor.

The operators who build the subassemblies deposit the units on the upper belt. The "final" assembly operators, stationed farther along in the line, thus have the subassemblies conveniently at hand. They add the three remaining bars. The completed grille assemblies are then placed on the lower belt (see photos) whose surface is even with that of the assembly benches.

At the end point of this second belt line the sparkling grilles emerge on a wooden table, where the final inspection is made. The packing station is to one side of the inspection table, which adjoins the truck loading door on the other side.

As indicated in the sub-title, the collapsible pallet boxes (furnished by the customer) incorporate features that merit a detailed examination. These containers are of the wirebound type and are assembled on a specially constructed pallet. The outside dimensions of the wirebound boxes are 40" wide by 55" long by 39" deep. The upper deck of the pallet is not attached directly to the stringers.

The LOAD DISPATCHER

A REMARKABLE TRUCK AT A REMARKABLE PRICE

The Load Dispatcher is adaptable to hundreds of material handling jobs around factories, foundries, warehouses, wharves, freight houses, etc., and will save time and money because of its unusually rapid and convenient handling. Its maneuverability and the ease of it amazes everyone who sees it for the first time. Nothing excels the Load Dispatcher for getting around where the going is tight. Its utter simplicity of design assures that it will require the very minimum of "time out" for attention and maintenance. From first cost on through its daily operation—fuel, labor, speed, maintenance—you will find that it contributes in full measure to economy of operation.

Load Dispatcher in a fertilizer factory with unusually cramped quarters for loading and transporting. Four men are now doing the work of 16 men formerly required with hand trucks. Net load shown—2400 pounds.

You will be interested in the many unique, practical features of the Load Dispatcher. Write for catalog. *Some valuable territories open for distributors who can qualify.*

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Material Handling Truck Division
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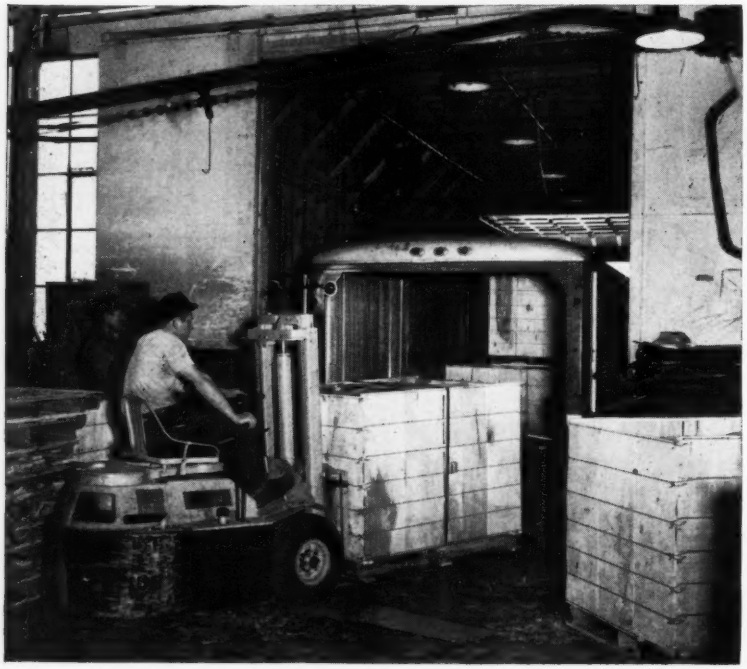
Nailed crosswise over the latter at even intervals are four 1" x 1¼" wood strips, the two outside ones set in an inch from the end of the upper deck. Thus a one-inch clearance is left at each end between the stringers and the top deck (which is of course nailed to the runners over the wood strips). The latter extend one inch on each side of the pallet.



OUTBOUND. Finished units move in cleverly designed wirebound pallet boxes. See detail drawing shown on page 42.

The wirebound walls of the box are in two sections—one end wall attached to each side wall. For assembly, the crosspiece at the bottom of the end wall is inserted in the opening between the stringers and the deck, and the side walls rest on the one-inch projections on each side. With the box sections placed in position, the looped wire ends from each section are pulled through each other and fastened to make a sturdy box integral with the single face pallet base.

The grilles are placed vertically in the boxes, each grille separated by a corrugated paper liner, which is also placed over each completed layer. The layers are also separated by use of wood strips at each end. Each wirebound pallet box has a capacity for 27 grilles. The boxes have no tops, and a band of steel strapping applied crosswise (see photos) gives the loaded containers the necessary support for the trip to the user's plant.

FIG. 16-24 Two-Wheel Trucks for Every Use

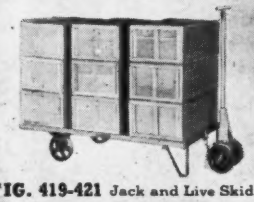
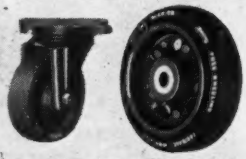


FIG. 419-421 Jack and Live Skid



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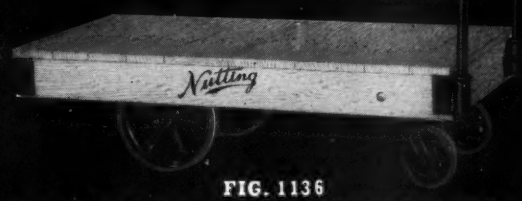

FIG. 1136
One of Many Sizes and Styles of Bar Handle Platform Trucks

NOW is the time to Engineer your Materials Handling

Your materials handling system needs to be just as carefully planned and engineered as your production set-up, or the design of your products. A planned layout may well be the difference between profit and loss, between smooth-flowing operation and a time-wasting series of bottlenecks. Take advantage of the seasoned experience and valuable advice of a Nutting Engineer. Because the all-around adaptability and versatility of Nutting Trucks has never been excelled, he can advise you on the proper use of trucks with overhead or floor conveyors . . . assembly or production line use . . . interdepartmental use . . . warehouse or shipping room use . . . as well as situations where only trucks should be used.

LOOK *in your Classified Telephone Directory* to contact your nearest Nutting Sales Engineer, or write to us direct. Ask for Bulletin 47-G.

Over 1000 Nutting Designs

56 years of specialized, continuous experience in building materials handling equipment is embodied in the Nutting line for your benefit. We supply every need in floor trucks, casters, wheels—including specially designed trucks for specific needs.

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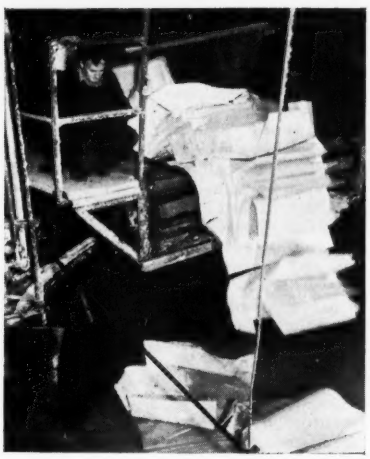
SMALL PORT CLEARS MILLION TONS

Key to successful operations at Inland Navigation Co.'s dock at The Dalles, Ore., is a Diesel-powered crane which handles all freight to and from the barges. Serving as a terminus for seven tugs and 32 barges which serve

the Columbia River and other northwestern waters, the port cleared more than a million tons of freight last year. The crane is in daily use, meeting the requirements of the port where numerous barges tie up in a single day to take on cargo or disgorge freight.— Courtesy, Caterpillar Tractor Co., Peoria, Ill.

CONVEYOR LOADS HYDROPULPER

A slat conveyor drops 6000 pounds of dry fibre into a hydropulper at Riegel Paper Corp., Milford, N. J., as the first step in the manufacture of glassine paper used for wrapping frozen foods, making "window" enve-



lopes and other applications. After only a few minutes of mixing, the pulp slurry is drained off and a new charge dropped into the vat. The conveyor eliminates a great deal of travel time between the dry fibre storage and the vat.—***Courtesy, Riegel Paper Corp., Milford, N. J.***

BRUSCO LABOR SAVING MATERIAL HANDLING EQUIPMENT

Brusco heavy steel parts boxes are built especially to reduce manual labor, increase production, and to save valuable space. The boxes are rigidly constructed to endure rough treatment and can be tiered easily and quickly.

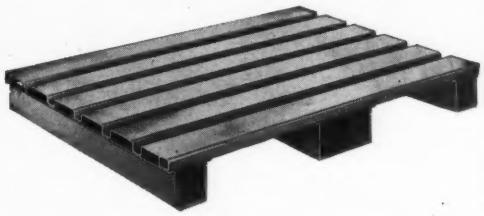
Fabricated from heavy guage steel sheets, Brusco Boxes are corrugated for extra strength, reinforced with heavy steel angles and are constructed throughout to eliminate any maintenance expense.

Legs have skid plates for easy moving. Built to last indefinitely. Standard sizes:

24 x 24 — 26½ x 36
36 x 42 — 30 x 48
36 x 48 — 36 x 60
Depth 18", 24" or 30"

Boxes equipped with card holders for stock records.

Orders or inquiries should specify quantity, width, length and depth of box desired. Also state underclearance required and estimated weight of load. We are able to fulfill any special requirements.



Brusco Single-Face Steel Pallet Box-Runner Type

Brusco corrugated Steel Pallets, single face, box runner type, 3000# capacity each, 20,000# tiering capacity. Size: 36" wide, 48" long — 4" underclearance. Lots of 50 or more $16.00 each.

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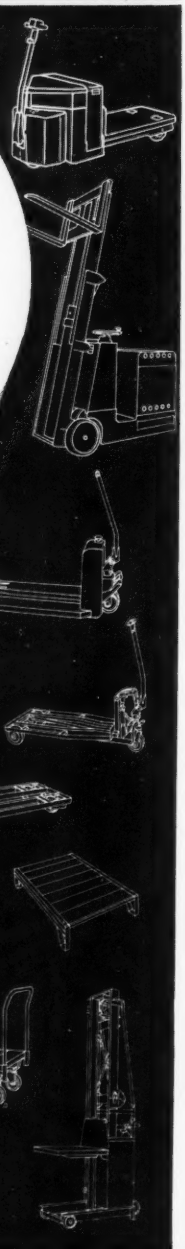

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NEW METHOD FOR TIN CANS

A NEW method for shipping tin cans has recently been developed by the Vulcan Tin Can Company of Bellwood, Illinois. The old method of packing and shipping has been replaced with galvanized round steel straps as the binding and sealing medium for tying and bundling these cans together. Thousands of cans are tied and delivered daily by this method.

A wooden rack made of a base of 2x4's, inserted with a sliding V-shaped upright and adjustable back is set up on a table just below the finished can conveyor. The rack is adjustable to fit the sizes of the various cans made by

the company. Its upright V members whose end play is variable (they can be set and instantly adjusted by wing nuts) also possesses a back frame that is variable as well, so that the can flanges lie immediately atop it. The machine operator draws sufficient galvanized strapping to bundle the group of cans which she is to reinforce and seal. A predetermined number of cans pour from the conveyor on top of the strapping. Inserting the end of the strap into the strapping tool, the operator pulls the handle forward, then back—one complete cycle—and the tensioned and sealed bundle of cans is complete and ready for shipping.

The strapping tool is affixed to a long steel suspension arm, as shown in the photo. This in turn is attached to a steel pipe upright firmly fastened to a steel base plate. It can be swung about and pushed back to the wall when not in use, giving plenty of space for other operations in the same area. The tool is suspended by spring tension and moves at a touch of the finger, either up or down, and is easily adjusted to any size bundle of cans. After the tie or seal is made, the tool "lifts itself" out of the way for the next operation.

Cans are tied rapidly by this new method. In addition, the usual large inventory of hard-to-get paper is now eliminated. Carload shipments as well as truck deliveries are being successfully made by this method. For LCL shipments and small cans the usual cartons or bags are used for wrapping. Customers have welcomed the new bundling method for their cans, inasmuch as there is no disposal necessary for wrapping materials. Many sizes of cans may thus be reinforced.

PACKAGING MECHANICS

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

Elapsed Time: Five Minutes

***18,000 cases of Quaker Oats (24's) packed daily on two 8-hour shifts. Elapsed time for a container through carton making, filling, case packing, and loading in freight cars is* five minutes!**

OF THE cereals packed by The Quaker Oats Co., fully 59 per cent consists of rolled oat products. The production of this item constitutes a large part of the output of the company's Akron, Ohio, plant.

The complete packaging layout covers four floors. On the sixth is the checking station for cap and tube slides, and here, too, is the feed point for the weigher machines. On the fifth floor, the tubes are capped, filled, shrunk and wrapped (labelled). On the fourth, the case packing and sealing operations are performed, and from this point a spiral chute leads into either rail cars or warehousing. The high-volume production figure given in the sub-title includes the making of the round containers (called tubes by the company), which is done on the seventh floor.

Six lines are devoted to the packing of regular sizes, and one line to the large size (various brands are packed in both of these). The subject of this description is the packaging of the regular size.

A feature of the operation is the provision made to prevent down-time on the lines in the event a jam-up occurs at any one point. This is done through careful planning and the ability to work many sections independently. For example, if the bottom cap slide (chute) should jam, the operator at this station has an ample supply of tubes and caps on hand to be fed to the line, permitting the filling machines to continue to function. Other examples are given.

The operation is continuous from beginning to end, with slides and conveyors connecting the six lines on the four floor levels. Through the entire operation, the product is never manually handled and the units do not leave the lines until the full shipping cases land either in the outbound cars or the warehouse.

As indicated, it takes but five minutes for a single tube to travel from the seventh floor through the various packaging phases and (loaded in cases) to arrive at the freight cars. The planning to prevent down-time is one factor. Another is the application of mechanical devices in filling and packaging, all tied in with a continuous conveyor system.

CAPS GO ON. Bottom capper on fifth floor. Note the turner on line and tube slides.

Oats Start for Breakfast Table

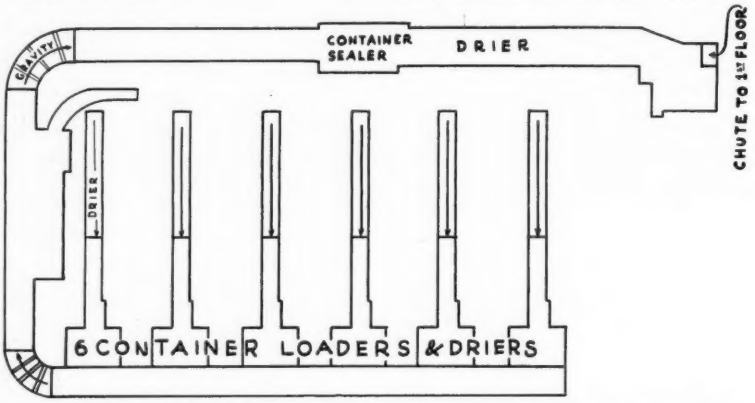
The fifth-floor filling department consists of six parallel lines (for regular packages), as shown in one

of the photos. The loading of the batch weighers (on the sixth floor) is accomplished by portable hoppers, mounted on swivel iron wheels. Precautions are taken by means of a signal system to prevent any batch weigher bin from running completely empty. When the material drops below a certain level, a light flashes a warning signal on the panel opposite the corresponding bin number. This prevents accidental stoppages and mistakes in filling, thus assuring a continuous operation.

Caps and tubes arrive from the seventh floor via gravity slides, with tubes feeding down one slide and caps down another, as shown in one of the photos. The tubes land on a 4-inch conveyor belt that carries them through gluing and then to the bottom capper. The caps arrive about two feet ahead of this station, where they are positioned by a guide belt and then dropped over the glued portion of the tube.

Only two operators are on each line, which travels west. One operator is stationed at the head of the line to (1) assure a continuous supply of tubes and caps and (2) to check for damaged parts. If there should be a lack of supplies from the seventh floor or if the slide should jam, this operator presses a push button signal. It flashes a red light in the tube plant or rings a bell on the sixth floor.

If, for example, Line No. 3 should be jammed, the Tube and Cap Slide Attendant on the sixth-floor checking station removes the cause of the stoppage. But if the signal is for more supplies, the attendant switches on a light. This stays on until supplies start coming through again from the seventh-floor tube mill.



LAYOUT OF FOURTH FLOOR: Automatic packers and sealers make up this U shape layout.

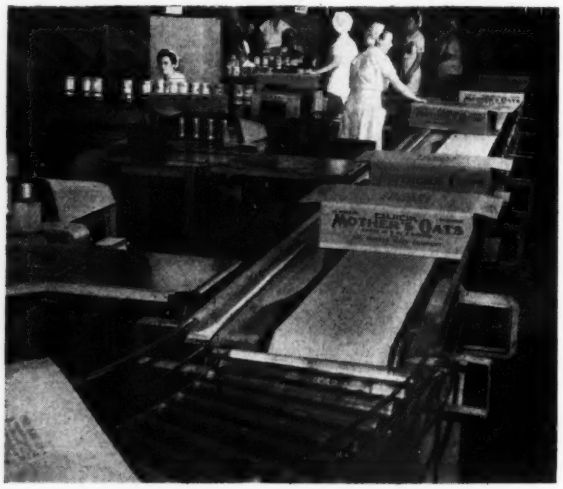
To continue with the filling: Since the cappers apply the bottom to the tubes standing in a vertical position, the tubes must be turned around completely in order to be positioned for the filling machine. This is accomplished by a turner, also shown in a photo. The properly positioned tubes travel about four feet to the filling machines, most of which fill three cartons at a time. The capacity of each of these machines is 76 a minute. (One filler fills six tubes at a time.) The product is net-weighed before filling. As a check on the accuracy of the machines, one operator makes regular half-hourly weighings. This girl serves four lines and travels about with a portable table and scale.

When the filled tubes emerge, they pass through the top capper, next in line. Like the bottom caps, the top caps are fed down via a slide from the seventh floor and are applied similarly. The second operator in the line is stationed here, and her duties are the same as those of the bottom cap operator.

Here is another example of how continued functioning is assured if one station becomes inoperative. If the bottom capper should be out of operation temporarily, the top filling machine and the top capper are kept functioning, as a supply of bottom-capped tubes are kept on hand. These are then fed into the line manually until the difficulty has been removed.

After filling and top capping, the tubes must be shrunk in order to

HEAT DOES IT: Wrapped cartons emerging from dryer. Automatic packer in foreground.



CASES TO SEALERS: Belt moving cases of 24's to automatic sealer. Note guide rails.

assure a well sealed package. (The top and bottom of the container is shrunk by means of a heat application to the cap at each end.) The shrinker is approximately 18 inches above the level of the filler conveyor, and the tubes are carried to it horizontally by an inclined chain conveyor on which bars are mounted at nine-inch centers. (The tube has previously been laid on the side by a twist in the line.)

The tubes drop from the conveyor into the shrinker, where they are picked up by solid metal carriers, called spiders. These revolve as they pass around the machine, and heat is applied to both top and bottom evenly so that the shrinking will be in the same proportion.

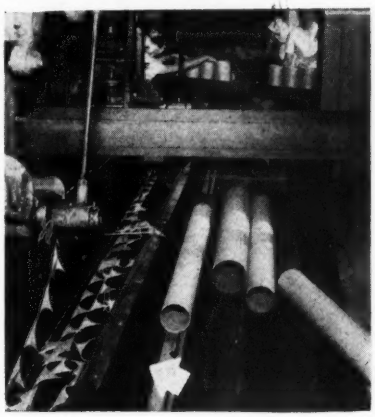
As the units emerge, they pass through another machine that applies the package wrapper, at the rate of 80 a minute. The drying takes place in an electrically heated tunnel. The latter is a conveyor housing in which the labelled containers travel on rigid-arm retainers, chain-mounted on six-inch-centers, that revolve to insure complete drying. This conveyor carries the packages of Quaker Oats to the fourth-floor case packing department. As the units emerge they are returned to a vertical position by a package turner.

The containers first travel past an inspector. She checks for (1) torn labels, (2) uneven application of labels, (3) double-checks correct fit of caps.

Preparation for Shipping

The case packing department consists of six conveyor lines, each fed by its own dryer conveyor from the floor above. (This same multiple is used throughout the packaging procedure.) As the flow sheet of this department shows, the cases from all packing lines feed to a single case sealer and dryer via a belt conveyor.

The inspection line is a 4-inch-wide belt eight feet long. This carries the units to the case loader, which packs them four at a time and 24 to a carton. The timing cam permits only four units to pass in front of the packing arm at one time. Upon completion of the sixth pass, the full case is kicked off and deposited on the case turner. The latter is a metal turntable, revolved manually by the operator stationed here. Incidentally, she is the only other operator on this line in addition to the inspector. If a case should be damaged, this operator shunts it onto a roller table (reject station) for removal by the floor inspector. This operator also closes the two inside flaps as she slides the cases onto the belt line.



TUBES AND SCRAP: Tubes on way to cutter while scrap moves to bailer via conveyors.

As can be seen from the flow sheet, three sections of powered belt conveyor, connected by gravity roller curves, form a U around the layout. Wooden guide rails along the entire length of the conveyor keep the flaps in position for the sealer.

The latter is located approximately in the center of the third belt. As the cases enter, a stamping arm marks each one with the code marking of the month, mill, day and year. The sealer has been greatly speeded up by the installation of a special drive which allows the equipment to exceed its rated capacity.

A short distance beyond the compression belt the completed cases are discharged into a spiral chute on which they may be routed either to shipping or warehousing. This chute carries them from the fourth floor to the first.

With thousands of cases traveling over the lines daily, the matter of correct tabulation is important. An accurate count is obtained by use of mechanical counters which are installed at (1) the end of the tube wrapper, (2) ahead of the case sealer and (3) at the entrance to the spiral chute. By having a counter both at the case sealer and the delivery chute, the difference between the two totals indicates the cases that may have been removed (for one reason or another) from the line. And the tube count serves as a verification of both figures.

Glance at the Tube Mill

The reader will appreciate that the maintenance of full production is directly dependent on efficiency in the tube plant, located on the seventh floor. A constant supply of packing materials is assured through inter-departmental work scheduling. The schedule must provide sufficient paper ahead for 48 hours of production, as paper must be seasoned in a dryer for 24 hours. This makes for proper glue absorption and even application.

Several elevators deliver the paper rolls from the car dock, with each roll 7,150 lineal feet in length. After seasoning, the paper is rolled a few feet to the tube winding machines, where the rolls are lifted and positioned by chain hoists. Eight tube winders form the tube lengths in two sizes—regular and large.

Tubes are ejected from the machines on a 40-inch canvas belt, shown in one of the photos, which delivers them to the cutters. Eight cutters are positioned in a straight line with one operator serving each two machines. Twenty-six tubes feed to the cutters a minute. The cut sections from each machine are ejected onto a narrow belt conveyor. These lines feed the material to the tube chutes that terminate in the packaging department on the fifth floor.

Thirteen punch presses, using flat stock, produce both top and bottom caps. The completed pieces are likewise delivered by belt conveyors that discharge into the cap slides for delivery to the top and bottom cappers.

The photo of the tube mill oper-

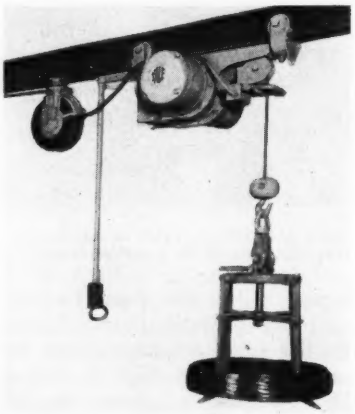
(Turn to page 64)

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

STIFF ARM HOIST

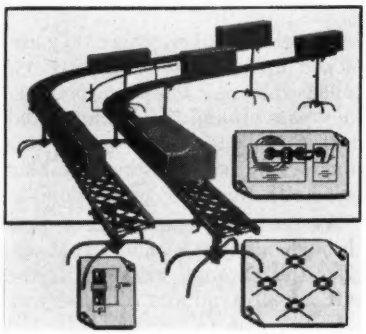
NP147—A specialized electric cable hoist has been developed by Yale & Towne Manufacturing Co. Designed especially for "wire stripping" in steel mills, Yale & Towne reports the equipment also has usefulness in other fields where the use of a stiff arm for manual spotting to close tolerance is important. The arm is built so that it can be used laterally to push a bridge beam or jib, on which the hoist may be mounted, as well as to push the hoist itself in a transverse direction.

Offered in four capacities, from 500 to 1500 pounds, the hoists are available in various lifting speeds and lifting heights. The equipment requires only 15¼ inches of head room, according to installation specifications. Action is controlled by push buttons at the end of the stiff arm.



ALUMINUM CONVEYOR

NP148—Production of an aluminum standardized Load-Veyor has been started by Market Forge Co.



With the exception of hardened steel bearings and raceways in the wheels, the equipment is made entirely of aluminum. The design follows exactly that of the all-steel

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EXTRA features like these assure greater power and operating economy: Powered with the famous Ford 4-cylinder tractor engine, tops in power and freedom from trouble . . . Standard Ford parts, readily available locally . . . 8-roller carriage in the hydraulic lift assembly instead of the usual 4 or 6 . . . Heavier steel frame . . . Oversize drive wheels and tires . . . Full hydraulic brakes . . . all parts easy to get at for quicker servicing and lower maintenance cost. *Ask your Service Distributor for full details.*

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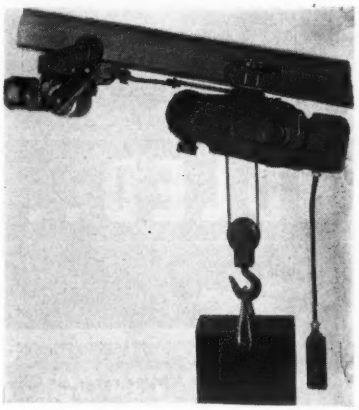
Load-Veyor which has been on the market for several years, the manufacturer states. It is reversible to accommodate wide and narrow. At the present time, most of the production of conveyors is going to plants which handle highly hazardous materials such as powder, dynamite, etc. The manufacturer points out that aluminum will not create sparks but acts as an excellent conductor of static electricity. In addition, the non-rusting quality of the lighter metal is an advantage in outdoor use. The aluminum conveyor weighs 30 pounds to the 10-foot length.

MONORAIL TRACTOR

NP149—A new idea in traction effectiveness has been included in the Trojan monorail tractor, according to the manufacturer, Detroit Hoist & Machine Co. The tractor, suspended on a pair of wheels that run on the top surfaces of an overhead monorail beam flange, is so fulcrumed that its own weight exerts a pressure against a second pair of wheels which run on the underside of the flange. The result is an effective "biting action" that permits a relatively small electric-powered tractor to travel



comparatively heavy loads even up inclined monorails, it is claimed. The manufacturer reports the Trojan tractor can be applied to existing hand-operated monorail hoists by power, open and close garage and airport hangar doors, and travel monorail conveyor lines. It can also be applied to travel existing hand-operated crane bridges by power.

HEAVY DUTY PALLET

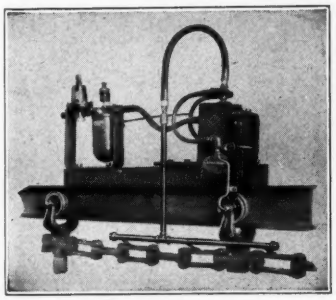
NP150—Acme Pallet Co.'s latest contribution to improved palletized methods is its Drive Screw Spike Cargo Pallet, Type 10. It is a large size pallet, according to the manufacturer, designed to withstand heavy duty work, including stevedore and shipboard palletized handling. They are made of hardwood and are available with dressed or rough outside surfaces.

BOOK TRUCK

NP151—Designed especially for curing rubber in process, a new book truck has been announced by Palmer-Shile Co. The truck, according to the manufacturer, can be used in production of plastics and other products where rapid drying or curing of sheets or parts are essential. Constructed of heavy gauge steel, the truck is equipped with extension springs to permit easy raising and lowering of individual shelves. When in raised position, the shelves are automatically held up to permit accessability to the entire surface.

Equipped with metal or rubber tired wheels or casters, they can be built with legs or skids to ac-

Controlled Conveyor
LUBRICATION



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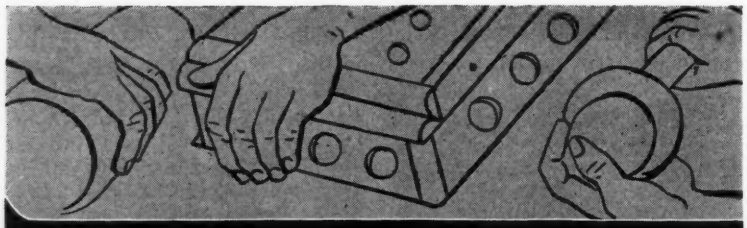
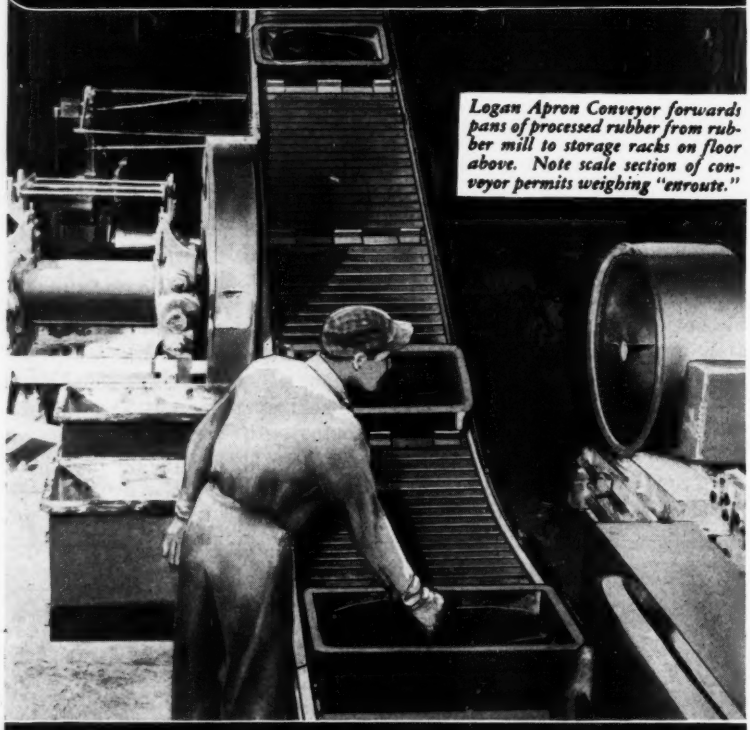
Walter Stuebing, *President*
2425 Spring Grove Ave. Cincinnati 14, Ohio



LEAST HANDLED..



Logan Apron Conveyor forwards pans of processed rubber from rubber mill to storage racks on floor above. Note scale section of conveyor permits weighing "enroute."

IS BEST HANDLED

Every time your product is handled manually it incurs added cost as it progresses through the successive stages of manufacture, assembly, packing, shipping. By reducing the number of times a product is "hand-handled" many manufacturers have shown either increased net profits or have undersold competition . . . in some instances have done both.

With all Logan Conveyor installations there follows a definite reduction in production costs. In fact, this company will not recommend an installation unless savings in operation are definitely indicated.

Look to Logan for the best in modern handling. The Logan name on your conveyors is assurance of maximum savings in time, effort, space . . . and in employee satisfaction and appreciation.

Logan Conveyors

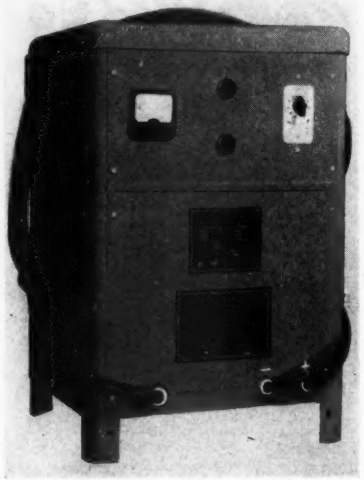
LOGAN CO., INC., 558 CABEL ST., LOUISVILLE 6, KY.

commodate power lift or hand-operated trucks. According to the

manufacturer, the trucks can be manufactured in all sizes to meet production needs.

RECTIFIER CHARGER

NP152—A new line of rectifier chargers, known as Recktotruck Chargers, has been announced by P. R. Mallory & Co., Inc. The manufacturer claims the six models in the line will charge 90 percent of the batteries used in industrial trucks. Three models are designed

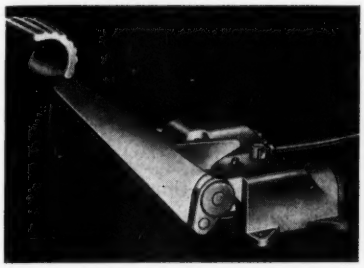


for hand trucks and three for operator-ridden trucks. The line is designed to charge either lead or Edison-type batteries from either of two standard power line voltages, according to the manufacturer. The chargers are compact and may be located anywhere within the operating range of the trucks. The operation of the chargers is automatic for lead batteries, requir-

ing no hydrometer readings or special settings. Test fork readings and timer settings are recommended by the manufacturer for Edison-type batteries.

HYDRAULIC FOOT PUMP

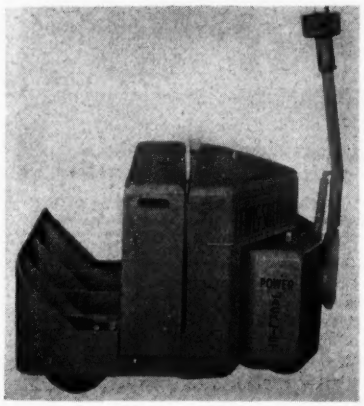
NP153—LYON-Raymond Corp. has introduced a new model lightweight hydraulic foot pump. Special features in the device, as



claimed by the manufacturers, include a built-in oil strainer, an adjustable relief valve and a chrome plated piston for smooth operation. The pump weighs 13¼ pounds. The flat base has three bolt holes for easy mounting. The manufacturer reports working pressures of 1500 psi. The 15 cubic inches of usable oil are contained in a steel reservoir requiring no vent, which permits mounting in offset positions if necessary.

POWER JACK UNIT

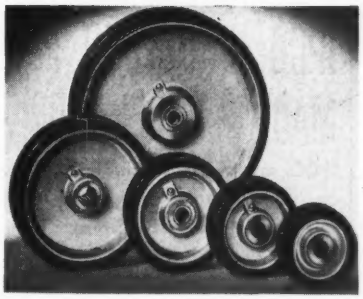
NP154—Lewis-Shepard Products, Inc., has added a JackTractor unit to its line. The unit is built to tow trailer trains but it may also be used for pushing. Powered by a



6000-pound capacity power lift master drive unit, the manufacturer states it has a maximum draw bar pull of 500 pounds. Any of the standard types of hitches or a special type hitch, conforming to customer's requirements, will be supplied. The manufacturer has announced that the unit is designed to save up to 18 inches in aisle space through increased maneuverability. The brake control, two speed control, forward and reverse control, raising and lowering controls, horn and lock switch are located in the handle head and are electrically operated.

ALUMINUM ALLOY WHEELS

NP155—A new line of aluminum alloy industrial wheels of compact



design and in a complete range of sizes from four to 12 inches in di-

WHAT'S *YOUR* HANDLING PROBLEM
16 oz. Bottles or 600 lb. Crates ?

An A-F Conveyor System Handles Products More Economically

—Why Be Satisfied With Less?

IS an A-F Gravity Roller Conveyor System best for your plant? Or should an A-F System of Power Rollers—or an A-F Belt Conveyor—or perhaps an A-F Overhead Trolley System be installed for greater efficiency and savings? Only a careful study of your materials handling and products handling will give you the correct answer. Our engineers are backed by 46 years of know how. Why be satisfied with less? Write for a discussion—or for literature today.

THE ALVEY-FERGUSON COMPANY

438 Disney Street — Established 1901 — Cincinnati 9, Ohio

Offices in Principal Cities Coast-to-Coast

CONVEYING EQUIPMENT

Alvey-Ferguson

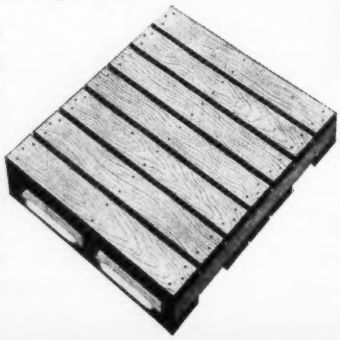
METAL PRODUCTS CLEANING EQUIPMENT

IPCO HARDWOOD PALLETS ARE MADE WITH HELYX DRIVE-SCREWS

IPCO engineered pallets are constructed with cement coated, No. 6, 2½" Helyx drive-screws with non-split chisel point. These drive-screws are staggered, hand driven into unseasoned hardwoods . . . assuring maximum durability and economical service. Made to specifications to suit your needs. Inquiries invited.

Send for our new materials-handling bulletin . . . advises how to cut your operating costs.

The IPCO representative is a materials-handling engineer. Consult him on your palletization problems . . . no obligation!



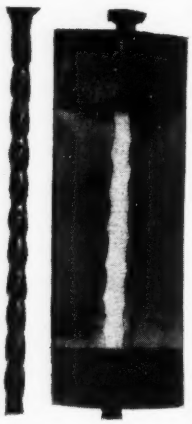


Photo of the Drive-Screw and a cross-section of a piece of hardwood into which a Drive-Screw has been driven . . . made by grinding on an emery wheel through wood and half the thickness of screw. It shows the powerful grip of Drive-Screws . . . the secret of the great strength of IPCO Pallets.

IPCO

INDUSTRIAL PALLET CO., INC.

PALLETS EXCLUSIVELY SINCE 1941

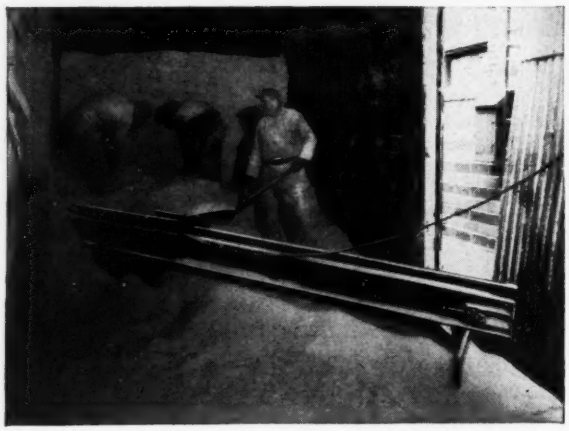
1616 WOOLWORTH BLDG., NEW YORK 7, N. Y.

Telephone BArclay 7-8446-7

ameter has been placed on the market by Airlite Division of the Aerol Co. The company announcement explains that the wheels have been designed to fill the need for an economically-priced, easy-rolling wheel of maximum efficiency. Marketed under the trade name of Airlite, they are available either with molded-on rubber tread or an all aluminum tread. The wheels may be had with either roller or ball bearings or bronze bushings. The roller or ball bearing equipped wheels have grease fittings to provide easy servicing.

SUCTION HOSE

NP156—Production of an additional type of smooth bore water suction hose has been started by Hewitt Rubber Division of Hewitt-Robins, Inc. The new hose is of chernack loom type construction in which the reinforcement consists of woven yarn carcass with interwoven spiral wire. The manufacturer emphasizes that this type of construction makes it possible to re-shape the hose if crushed or kinked.



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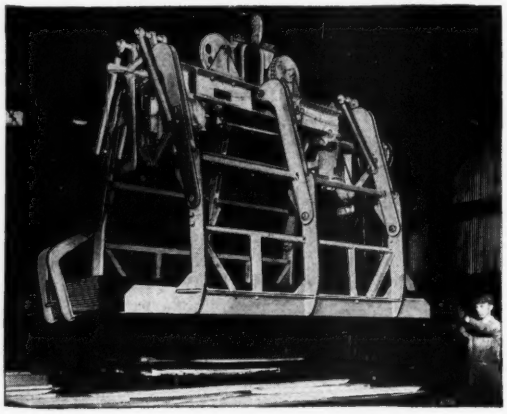
WILL SAVE YOU MONEY

They "speed up" the handling of materials of all kinds . . . bulk, boxed, bagged, etc. They'll enable you to do your loading, unloading, stacking, etc., in less than half the time formerly required, and with less effort. There is a size and type to suit your particular needs — also utility models that convey a wide variety of materials. Let AMERICAN CONVEYORS **lighten your** "materials handling" **burden.**

WRITE TODAY FOR INFORMATION

AMERICAN CONVEYOR COMPANY

1121 W. Adams St. • Chicago 7, Ill.



PROFITS BEGIN HERE . . .

When carloads of sheet stock are unloaded at the receiving room, actual manufacturing costs begin. But, when sheet stock is unloaded and carried into storage or to the machines with C-F Sheet Lifters, these costs are minimized—stock damage is eliminated and your end profit begins. Because C-F Sheet Lifters, under one man end or remote cab control, handle more sheets per load, safer, faster and more economically, they are the logical answer to the demand for modern, low cost materials handling.

There are C-F Lifters in capacities from 2 to 60 tons or larger, in standard for semi-special designs to meet any sheet or materials handling requirement. Write for new Bulletin just off the press.

Cullen-Friestedt Co., 1320 S. Kilbourn Ave., Chicago 23, Ill.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

CRAWLER CART

NP157—For moving loads up and down stairs, Menne Development Co., East Troy, Wis., has brought out a crawler cart on a caterpillar-type frame. Weighing 60 pounds, it has a rated load capacity of 1000 pounds. The dolly base is aluminum alloy with rubber and fabric treads long enough to cover three ordinary stair steps. A tubular frame with a handle, attached to the dolly, carries the load. A brake is provided to lock the treads when it is necessary to stop.

MARKING MACHINE

NP158—Adolph Gottscho, Inc., has added a smaller industrial marking machine to its series. Designated as Rolacorder Jr., it is intended for imprinting small cartons, boxes, cans, jars and continuous rolls of textiles and paper as part of an existing production operation. The device, according to the manufacturer, is attached to packaging, processing, conveying or other handling equipment in which the objects to be marked are firmly posi-

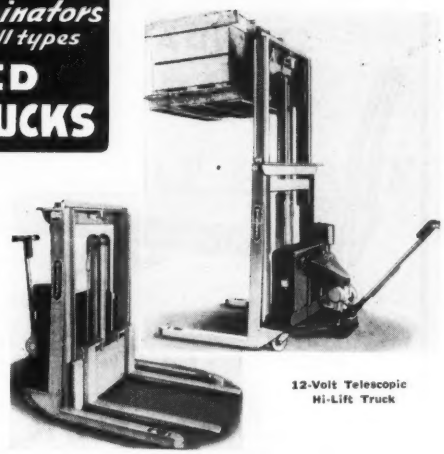
The choice of those who compare.

MOTO-TRUC *Originators of all types*
MOTORIZED HAND LIFT TRUCKS

Nowhere will you find motorized hand lift trucks that are as easy to control—two speeds forward and two reverse by a twist of the wrist on easy grip control handle, push buttons in ends of handle for hydraulic lifting and lowering.

They turn in smaller radius, due to most compact power unit. Their rugged construction and low operating cost are among other important advantages.

12-Volt Pallet Truck



12-Volt Telescopic Hi-Lift Truck

WRITE FOR BULLETIN 47-A

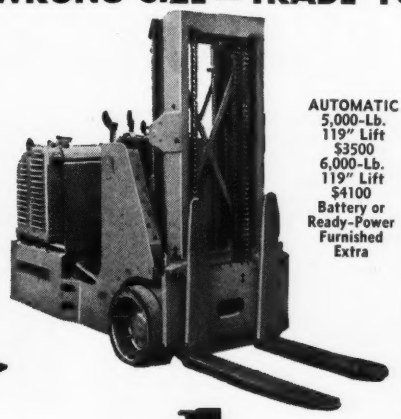
See our Exhibit at Booth 318
NATIONAL MATERIALS HANDLING EXPOSITION, *Cleveland, Jan. 12-16*

The MOTO-TRUC Co.
1953 East 59th Street
CLEVELAND, OHIO

IF YOUR LIFT IS THE WRONG SIZE – TRADE FOR ONE OF THESE

CLARK
3-Ton Gas Powered $2200*
2-Ton Gas Powered $2000
2-Ton Electric $2000
3-Ton Electric $3000

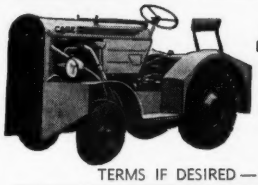
*Some Have New Tires at Additional Cost



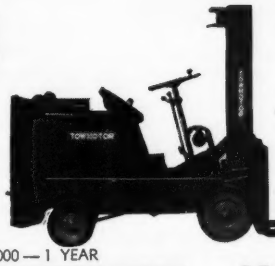
AUTOMATIC
5,000-Lb. 119" Lift $3500
6,000-Lb. 119" Lift $4100
Battery or Ready-Power Furnished Extra

LEWIS-SHEPARD
4,000-Lb. 108" Lift $2250
Battery or Ready-Power Furnished Extra

ALL VEHICLES RECONDITIONED AND SOLD WITH NEW TRUCK GUARANTEE



GASOLINE & ELECTRIC POWERED TRACTORS Solid & Pneumatic Tires



TOWMOTORS
4,000-Lb. 84" Lift, $2000
5,000-Lb. 108", 144" Lift, $2100
10,000-Lb. 72" Lift, $2000

ELWELL-PARKER
(not illustrated)
5,000-Lb. 117" Lift $3500
Battery or Ready-Power Furnished Extra

MERCURY
(not illustrated)
5,000-Lb. 104" Lift $3500
Battery or Ready-Power Furnished Extra

TERMS IF DESIRED — $42.50 — $1000 — 1 YEAR

DO YOU HAVE PROBLEMS IN YOUR WAREHOUSE?
LET US SOLVE THEM
We have graduate engineers with years of Army and Civilian experience in material handling and warehousing

YOU CAN ALSO RENT THIS EQUIPMENT BY THE DAY, WEEK OR MONTH, USING YOUR OWN OPERATORS.

HARRY M. RIGHTER, Inc.
PHONE ATlantic 1631 Cleveland, O. 7:30 a.m. to 4:00 p.m.
Foot of W. 45th St.—Former American Shipbuilding Yard—First turn toward lake west of High Bridge off Bulkley Blvd. 5 minutes from Square. OWNED, OPERATED AND MANNED BY VETERANS OF WORLD WAR II.

FLOOR TRUCKS

STANDARD AND SPECIAL

WHEELS: Metal - Rubber - Pneumatic

SPECIALS OUR SPECIALTY

MEMBER
CASTER AND FLOOR TRUCK MANUFACTURERS' ASSOCIATION
BUILT FOR EFFICIENCY

We take pride in our product and guarantee satisfactory performance and sturdy, long time operation under the most severe use. Agencies in most principal cities. Catalog gladly furnished upon request. Repeat orders testify to the efficiency of our trucks.

MAIN OFFICE AND FACTORY

ORANGEVILLE MFG. CO.

"Established 1879"

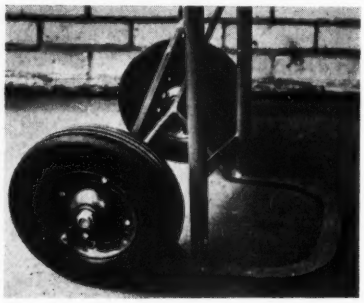
ORANGEVILLE 1, PENNA

FLOOR TRUCKS ORANGEVILLE

tioned while moving along the line. Imprinting is accomplished entirely by friction.

ZERO-PRESSURE TIRE

NP159—A new zero-pressure rubber tire is now available as an additional choice of wheels on the



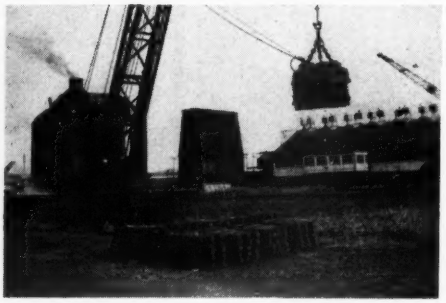
Wheel-Ezy metal hand truck manufactured by Rapids-Standard Co. The new wheel is 10-inches in diameter by 2½ inches wide. It has heavy side walls, hollow center and weighs seven pounds, according to the producer.

PACKAGE TRUCK

NP160—Scott Aviation Corp. is now manufacturing a new model

GERRARD REINFORCEMENT *"Delivers The Goods"*

Storage piles of crankshaft forgings in bundles of 25 each, tied with Gerrard Galvanized Round Steel Strapping. Note for inventory purposes how easy it is to count forgings.



Gerrard reinforced bundles of crankshaft forgings are unloaded from gondola cars and stacked in yard by electric magnet crane. Gerrard straps hold heavy bundle intact from shipping point to destination in auto plant.

THE GERRARD METHOD OF ROUND STEEL STRAPPING—with a non-corrosive finish—reinforces from Parcel Post to Pallets, and all types of cartons, boxes, crates bundles in between. The smooth galvanized GERRARD strapping makes its own tie, necessitating no other fastenings to hold the package rigid. Its ability to withstand transportation shocks is due to its ductility and its high tensile strength.

Finally it is 30% to 55% cheaper in cost over all other forms of metal binding. Write for our free **BLUE BOOK OF PACKAGING** and note that Gerrard Engineers are available at no obligation to you.

GERRARD STEEL STRAPPING COMPANY

2939 West 47th St. Chicago, Illinois

CURRENT DELIVERY* ON A HYSTER FORK-TYPE LIFT TRUCK, STRADDLE TRUCK OR KARRY KRANE

Hyster "20"

GO TO YOUR HYSTER DISTRIBUTOR FOR CURRENT DELIVERY

ALASKA
Northern Commercial Co.
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DALLAS, TEX.—C. H. Collier Company
DENVER, COLO.—Paul Fitzgerald
DETROIT, MICH.—Bentley & Hyde
HALIFAX, NOVA SCOTIA
A. R. Williams Machy. Co., Ltd.
HONOLULU, T. H.—Electric Steel Foundry Co.
INDIANAPOLIS, IND.—Central Rubber & Supply Co.
JACKSONVILLE, FLA.—L. S. Teague Equipment Co.
KANSAS CITY, MO.
Industrial Power Equipment Co.
LOS ANGELES, CALIF.—Hyster Company
LOUISVILLE, KY.—Embry Brothers, Inc.
MILWAUKEE, WIS.—Hyster Company
MINNEAPOLIS, MINN.—W. S. Nott Company
MONTREAL, P. Q.—A. R. Williams Machy. Co., Ltd.
NEW ORLEANS, LA.—Hyster Company of Louisiana, Inc.
NEW ROCHELLE, N. Y.—Eastern Industrial Sales Co.
OTTAWA, ONT.—A. R. Williams Machy. Co., Ltd.
PHOENIX, ARIZ.—Equipment Sales Company
PITTSBURGH, PA.—Equipco Sales Company
PORTLAND, ORE.—Hyster Sales Company
ST. JOHNS, N. F.—City Service Company, Ltd.
ST. LOUIS, MO.—Wharton L. Peters
SALT LAKE CITY, UTAH—Arnold Machinery Company
SAN FRANCISCO, CALIF.—Hyster Company
SEATTLE, WASH.—Hyster Company
TORONTO, ONT.—A. R. Williams Machy. Co., Ltd.
VANCOUVER, B.C.—A. R. Williams Machy. Western, Ltd.
VICTORIA, B.C.—A. R. Williams Machy. Western, Ltd.
WINNIPEG, MAN.—A. R. Williams Machy. Western, Ltd.
YUKON TERRITORY—Northern Commercial Company

In addition to above, Hyster Export Dealers are located in 30 foreign countries.

HYSTER COMPANY
THREE FACTORIES
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1831 North Adams St., Peoria 1, Illinois
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NOW you can get what you've NEEDED SO LONG. Expanded Hyster factory facilities make CURRENT DELIVERY possible.

Hyster "40"

7 HYSTER TRUCKS—ALL ON PNEUMATIC TIRES

HYSTER "20" FORK TYPE.....	2,000 lbs. Capacity
HYSTER "40" FORK TYPE.....	4,000 lbs. Capacity
HYSTER "75" FORK TYPE.....	7,500 lbs. Capacity
HYSTER "150" FORK TYPE.....	15,000 lbs. Capacity
HYSTER KARRY KRANE.....	10,000 lbs. Capacity
HYSTER "M" STRADDLE TRUCK....	12,000 lbs. Capacity
HYSTER "MH" STRADDLE TRUCK...	30,000 lbs. Capacity

Hyster "75"

Hyster Parts and Service Everywhere—See Your Nearest Distributor for Materials Handling Advice—for Catalogs.

Hyster "150"

*In a few restricted areas certain Hyster models are not immediately available due to heavy demands by certain industries, but increased Hyster production will soon relieve this situation.

Hyster Karry Krane

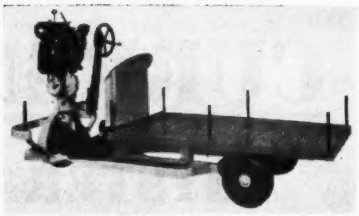
Hyster Straddle Truck

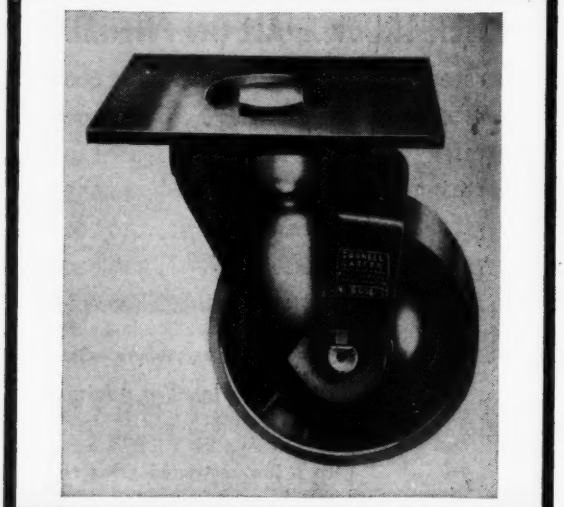
HYSTER "20"—2,000 lb. capacity. Only 37" wide. Ideal for work in narrow aisled factories, warehouses and in box cars.

departmental package truck in its "easy-tote" line. According to the specifications, the model has a platform 16 inches by 22 inches, two inches from the floor. It is equipped with three-inch needle bearing wheels. The front wheel is caster type which permits the truck to turn in its own length.

PLATFORM UTILITY TRUCK

NP161—A platform utility truck, which Truck-Man, Inc., states has been designed for performing odd jobs in material handling, has been placed on the market. Deck space of three feet by 5½ feet has been provided to handle awkward manually-loaded materials. The manufacturer reports it has full high and low speeds in forward and reverse from a 2¼ horsepower gasoline engine, and is able to turn in its own length. Dimensions of the truck are: length, 108 inches; wheelbase, 72 inches; ground clearance, 5½ inches; loading height, 16 inches; six-ply pneumatic industrial tires, 14x4.5.





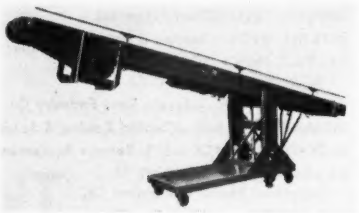
DARNELL
CASTERS & WHEELS

- Wearing parts carbonized and hardened
- *Patented* Double Ball-Bearing *Swivel*
- Maximum floor protection means savings
- Will increase efficiency of employees
- Made in any size for any type of use

DARNELL CORP. LTD. 60 WALKER ST. NEW YORK 13 N.Y.
LONG BEACH 4, CALIFORNIA 36 N. CLINTON CHICAGO 6 ILL.

BELT BOOSTER

NP162—Harry J. Ferguson Co. is producing a new 15-foot "Streamliner" booster. The long bed can be raised and lowered by a hydraulic jack mounted on casters for mobility. It is equipped with floor locks to prevent creeping while in operation. The unit can be controlled from the floor or stack ends, it is reported, enabling the stacking man to stop the operation.



According to the manufacturer, the equipment comes with gearhead motor, adjustable guard rails, "start-stop-reverse" switch and electrical cord.

MATERIAL DUMPER

NP163—A device for lifting and dumping quantities of free flowing materials, the Cesco Dumper, has been announced by Colson Equipment & Supply Co. Materials such as sugar, flour, nuts, powdered or liquid milk, chocolate, chemicals, light industrial products, stampings, etc., are placed in the skip, according to the announcement, a switch turned on, and the load is

lifted and emptied into bins, kettles or machines. It has a 500-pound capacity skip-box for liquid or loose materials or an open front skip for

bagged materials. Stainless steel skips may be had if desired, the manufacturer states. The dumper requires floor space of 36 inches by 65 inches. It is equipped with ball bearing swivel casters. Models come in five, six, seven and nine foot dumping heights.

POWERED HAND TRUCK

NP164—Comet Manufacturing Co. has announced it is now ready to supply its new "MotoTruck," built along lines of the conventional two-wheeled hand truck but having

a built-in power unit. The manufacturer claims the hand truck is able to move full-capacity loads up steep inclines and over obstacles without undue strain to the operator.

8-WAY PALLET

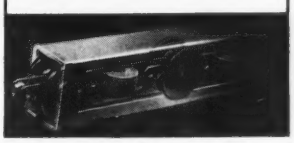
NP165—Initial production of an eight-way all-steel pallet in a single size, 40 inches by four feet, has been announced by Monroe Auto Equipment Co. The size was selected, according to the producer, to eliminate lost shipping space. It is explained that the pallets fit precisely using the 40-inch width when placed side-by-side in the bed of a truck or trailer. Using the 48-inch

dimension, they fit snugly into a freight car. The pallet is designed to permit forks of a lift or pallet truck to be slipped between the top and bottom sections from eight different directions, four side and four corners.

Flexibility plus!

IN AND AROUND UP AND DOWN
ZIG ZAG
Continuous Power Conveyor

- Horizontal and vertical wheel units alternate in a continuous chain traveling through rectangular steel tubing.
- Complete flexibility. Easily installed, easily altered.
- SAFE—all moving parts fully enclosed.
- Low first cost. Low power factor.
- Load capacity: Single suspension 65 lbs. per link—multiple suspension 125 lbs.; 250 lbs. per foot maximum.
- Standard horizontal or vertical curves —two-foot radius. (Stock load pendants including automatic turning units available.)



Flexibility . . . in and around, up and down . . . speeds from 1 inch to 60 ft. per minute . . . unit loads up to 250 lbs. Simplicity . . . a steel, tube-like track through which travels a specially constructed chain "just like water through a pipe." Those are two big reasons why Richards-Wilcox ZIG-ZAG Continuous Power Conveyors mean maximum efficiency at lowest cost for production lines.

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Scores of
IDEAS THAT PAY!!
in this
NEW BULLETIN
Uses Like These—

- Elevates dies to presses.
- Transfers dies from one level to another.
- Sheet feeding.
- Adjustable support for overhanging work.
- Work positioner.
- Loading and unloading motor trucks.
- Welding positioner.
- Elevates and revolves.

WRITE FOR IT!

This bulletin gives you the answers to many problems on material handling that may now bother you,

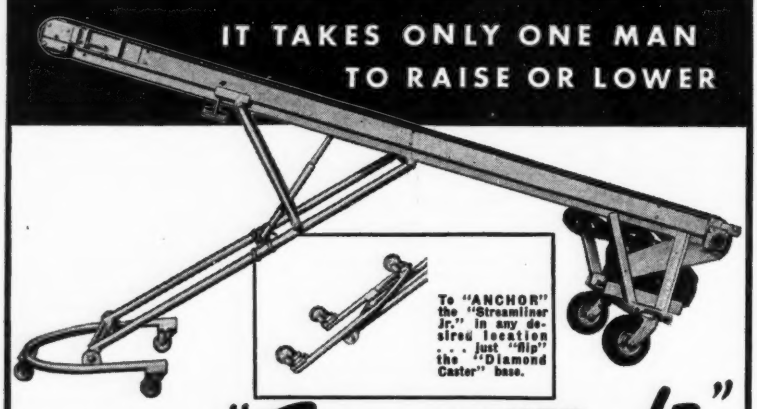
Here you'll see helpful application pictures . . . also ways to adapt this handy unit to special uses . . . features that add to safety and speed and save man-power . . . new handling methods supplementing certain machine operations . . . and other instances that whet the imagination of production men.

EXHIBITING AT MATERIALS HANDLING EXPOSITION

These visualized "Ideas That Pay" are not run-of-mill generalities, but information you can put to work quickly in your own plant. Bulletin 231 is yours for the asking.

LYON-Raymond Corporation
644 Madison St., Greene, N. Y.

IT TAKES ONLY ONE MAN
TO RAISE OR LOWER



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121 WEST AVENUE, JENKINTOWN, PENNA.

SHARPER PERFORMANCE . . .

(Continued from page 39)

drilled units, are likewise spotted in predetermined areas for easy disposal.

Thus, as the workers dispose of the grindstone upon completion of the drilling operation, the units are palletized in the normal course of fabrication. The pallet size chosen as standard is 36" x 42", which is most adaptable to the diameters of the various sizes of stones produced, from the viewpoint of maximum load capacity.

The drilled patterns are stacked in even rows on the double-face hardwood pallets. The completed loads are then moved by the truck to the grinding machines, next in line, where the loads are again within convenient reach of the handler working in conjunction with the machine operator.

The grinding machines, incidentally, were adapted by the company to this operation from the metalworking industry. The purpose was to realize a multiple grinding operation. Thus several stones are now ground on a mandril, as compared with the former method in which an operator cut one stone at a time on a machine, using revolving steel circular blades which removed the excess material.

The handling at these stations again illustrates flow engineering for maximum output with minimum human effort. Each pallet load is spotted directly before the loading jig, on which three mandrils are attached radially on a vertical axis.

Each mandril has a capacity for six two-inch stones, which are ground at one time. When a mandril has been loaded, it is lifted by an electric jib hoist (one hoist covers each machine) of one-half-ton capacity. An interesting feature of the hoist handling is that a chain fall (spur gear block) is suspended from the hook of each. While the electric hoist serves for speedy lifting and lowering, the chain fall is used for close and gradual adjustment of the stones on the grinding machine.

The electric hoist replaces the finished stones on the loading-unloading jig. The latter is revolved toward the grinding machine, and

the next loaded mandril is then lifted and set into the grinder. Meantime the helper unloads the finished grindstones from the mandril just removed, placing them on the pallet. He then reloads the empty mandril with rough patterns. Thus a constant supply to the grinding machine is assured: 1. One mandril is being set into the grinder. 2. The second mandril is the "reserve" load. 3. The third one is being unloaded.

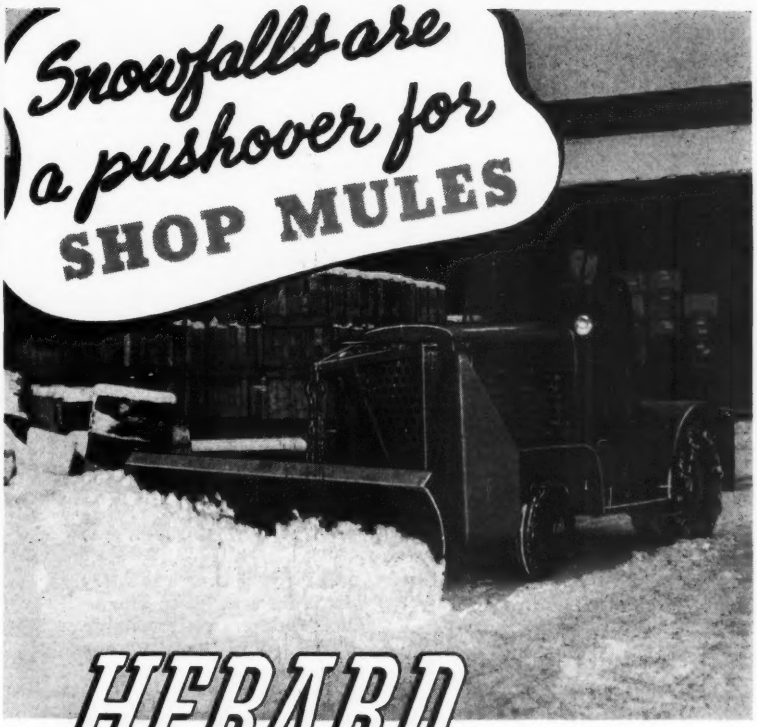
The full pallet loads of finished stones are removed by the fork truck, which triple decks them in the adjoining storage area. While the storage space is relatively compact (it takes up less than one-third of the plant), the stacking feature nevertheless permits up to 10 carlots to be stored in the areas. This is an ample stock for all practical purposes. One of the photos shows the neatness and compactness of the stacks. Individual pallet loads weigh between one to two tons.

The railroad spur is at the east end of the plant, and the fork truck speeds loading considerably by running the pallet loads into the outbound cars.

So far, most of the shipments still require the stones to be loaded individually. To avoid this piece-by-piece handling, the Cleveland Quarries management has within recent weeks surveyed its customers to stimulate acceptance of pallet shipments, according to President A. E. Tulk. It was he, incidentally, who worked out the advanced ideas now in operation in the new grindstone plant.

Customer cooperation is essential, and customers have a good incentive: the economies they can obtain from power handling of strapped 1½-ton pallet loads (instead of stone-by-stone unloading). The management is waiting to hear from additional customers who have received the questionnaire.

The physical handling details have been worked out. For shipping purposes, two lengthwise and two crosswise bands of one-inch steel strapping are applied over thin wood strips which are placed against the sides and the top of the loads. The wood strips serve for tensioning and also prevent the bands from cutting into the relatively soft stone.



HEBARD SHOP-MULES

HEBARD SHOP MULES can easily be fitted with snow plows, snow sweeper brooms, and cabs for increased utility in winter weather. These attachments will help you keep your sidewalks, loading docks, and storage areas free from snow for greater plant efficiency. Equip your tractor *now* with a "V" type or 5 position straight blade snow plow or snow sweeper broom.

MODEL A14V

Pneumatic tires and narrow width make this tractor ideal for plowing sidewalks and loading docks.

MODEL A21

Large diameter drive tires easily climb curbs, railroad crossings and rough ground for municipal or plant operations.

MODEL J233

Dual pneumatic drive tires for heavy pushing or pulling jobs and ideal for snow removal from large storage areas.

International Harvester power. Parts and service available the world over.

SHOP MULE INDUSTRIAL TRACTORS INTERNATIONAL HARVESTER POWERED

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3 Ton Euclid Crane built for the City of Schenectady.

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One man can handle heavy dies up to 500 pounds alone. Easily moved about. Also handy for loading and unloading trucks and miscellaneous lifting jobs. Platform 24 in. x 24 in. Lift of platform 4 ft. 6 in. Price $157.50 (foot operated floor lock optional, $10.00 extra). Heavier capacities available up to 5000 pounds.

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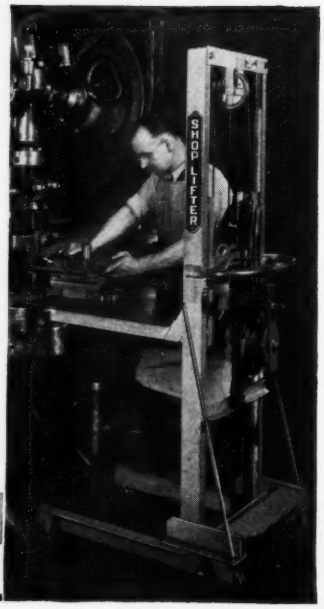


ECONOMY ENGINEERING CO.
2677 West Van Buren Street
Chicago 12, Illinois

Following are the business arrangements proposed by the Cleveland Quarries Co. to its customers. The shipper will pay the freight for the pallets on the outbound trip, and the receiver will stand the charge for the return of the empties. The shipper will charge the receiver for the pallets at the time shipment is made, and a credit will be issued when the empties are received at the Quarries Company.

While at present pallet shipping has been considered chiefly for customers in the United States, President Tulk feels that in time pallet shipments to such nearby export destinations as Cuba may also become feasible.

(Pallet handing, by the way, is nothing new to this company, which adopted this method for certain fire stone shipments some time ago. This and other aspects of the company's plant-wide handling methods were reported in the article, "These Stones Gather No Moss," November, 1946.)

As press-time approaches, word from the Cleveland Quarries Co. indicates that customers in increasing numbers are signifying their readiness to accept pallet shipments. (Some customers do not as yet have the necessary equipment.) The full-scale realization of pallet shipments will bring to a logical conclusion the modern handling procedures which have been effectively applied in receiving, fabricating and storage. Through the coordination of fork truck and hoist handling the heavy loads flow effortlessly through the compact layout into outbound cars. When final cost figures have been assembled, it is expected that the new methods (including the part contributed by multiple grinding) will result in savings that will exceed 33 per cent of the cost of the old method.

PACKAGING MECHANICS . . .
(Continued from page 51)

ation also shows that the waste (cullage) disposal utilizes a belt conveyor. All cuttings from the punch presses drop onto a belt which discharges into a chute that delivers to the baling hopper on the third floor.

The neatness, cleanliness, and speed of the operation are evident

from the foregoing paragraphs. All methods are designed for maximum production from the continuous layout on the several floors. While, for example, inter-departmental work scheduling assures a constant supply of materials, planning in anticipation of stoppages eliminates line down-time and thus assures a continuous operation. Note, too, that full utilization is made of all floor areas by means of compact conveyor arrangements.

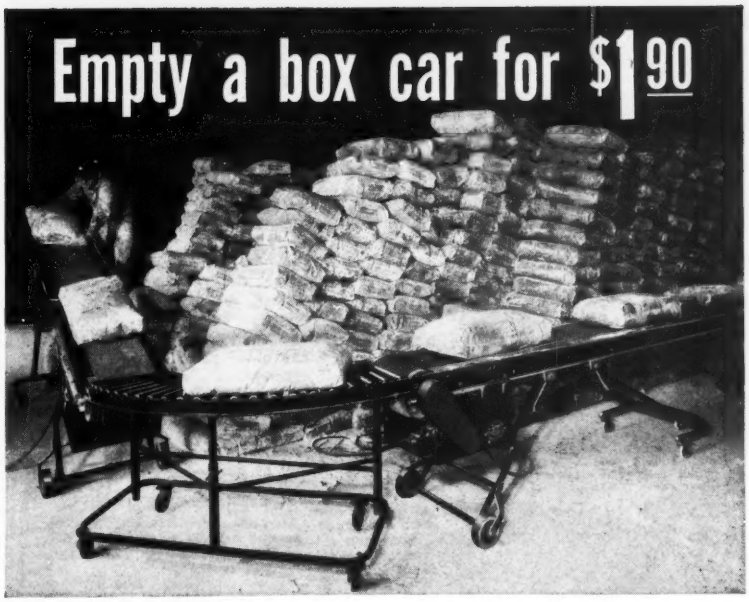
The efficiency of the operation is largely explained by the constant research program which The Quaker Oats Company maintains throughout its nine plants. Tests for better methods are constantly in progress, and approved ideas are applied for ever greater efficiency and economy of operation.

PACKAGING PLASTIC

THERMO-DIP *N.S.*, a new hot melt compound for protecting machine tools, cutting gears, etc. from corrosion, abrasion and the hazards of shipping and handling, has just been announced by Eronel Industries. The new member of the Thermo-dip series, while lower in cost, has a higher tensile strength, greater elongation and slightly lower melting point, the company states. It is pale amber in color and identifying marks can easily be read because the product is transparent, is removed by stripping and can be reused repeatedly. It maintains its flexibility and properties over extended periods. It is claimed to have excellent resistance to salt water, high humidity and low temperature and is said to be resistant to shock, cut-through and abrasion.

WRAPPING MACHINE

DUE to changing demands, bakery firms are often searching for new products and new packages. Each change in package size or shape creates a packaging production problem. One solution to this problem is a single machine that can wrap cakes, turnovers, cookies and even small pies without major changes or adjustments. Claimed to be such a machine is the one manufactured by the Battle Creek Bread Wrapping Machine Company. Highly flexible in operation, this machine is said to handle packages of all shapes and sizes—round, square, oblong, rectangular, tapered, or even a group of loose items assembled on a card. This equipment is said to provide "continuous flow" operations and to have eliminated jerky stop and start movements which jar the icing, or mar the packaging of cakes and cookies. Units of 6-12-18 or other multiples of cookies may be handled by this model. An electric eye may be used to register all printed papers carefully to make a trim, neat appearing package. With an accessory attachment a cardboard or scored U-board may be coded, dated and automatically fed into the intake pocket of the machine.



former cost $17.10

DIRECT SAVING $15.20

When bagged cement and aggregates were handled by hand truck from box car to warehouse, it required six men working for at least three hours to empty the car and stack the bags. Now, since Rapids-Standard Stevedore, Jrs. have been installed, four men empty a car and stack the bags in half an hour. At 95c per hour this means a direct saving of $15.20 on every car unloaded. And, there are indirect savings in less wear and tear on floors and smaller demurrage charges since freight cars are not held for as long.

H. H. Dickenson Company of Detroit, who operate this system, also use it for handling metal lath, 50 and 100 pound chimed cans of plastics and roofing cement and the many other articles handled by a large building supply house. This equipment paid for itself in direct savings very soon after it was installed and continues to deliver comparable savings every day that it is used.

Rapids - Standard Stevedore, Jrs., Rapid Power Boosters, Rapid - Wheel and Rapid-Roller Gravity Conveyors and Floor-Veyors will save time and money in handling cartons, kegs, cases, bales, cans or packages. Write today for full information on how they can save time and money for you.

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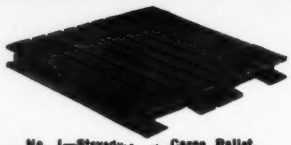
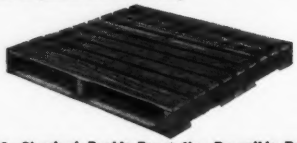
PROMPT SHIPMENT AT LOWEST PRICES ON ANY PALLET

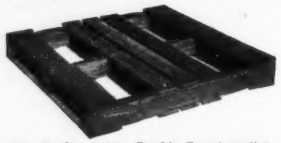
ORDER FROM 1 CAR to 100 CARS!



No. 1—Stevedore Cargo Pallet. Non-reversible, double-faced, with over-hanging deck boards to permit use with sling.



No. 2—Standard Double-Faced Non-Reversible Pallet. Slatted deck design. Bottom boards are spaced to permit entry and elevation by either hand-truck or electric fork trucks.

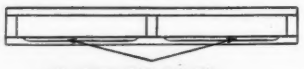


No. 3—Reversible Double-Faced Pallet. Both upper and lower deck boards are spaced to permit entry of pallet trucks.

What are *your* pallet requirements? Write, wire or phone for prices on our line. We believe we can offer a lower quotation than any other pallet company in the country . . . and *furthermore* make PROMPT SHIPMENT! Ozark Pallets are outstanding in constructions and utility. They are everything you demand in a pallet. Contact us *now.*

Representatives Wanted!

Attractive commissions can be earned by our sales agents. Get our proposition. Many good territories still open.



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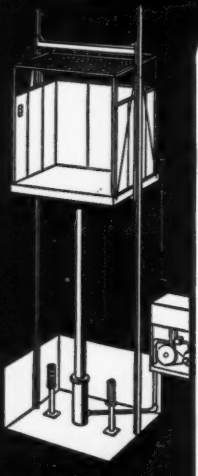

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Rotary®

OILDRAULIC® ELEVATORS

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MOST MODERN PIER . . .

(Continued from page 28)

of pallet loads would permit maximum utilization of floor load capacity, which will be 500 pounds per square foot.

The net cargo handling area of the new Pier No. 4, after deducting the space allowed for the aprons, truckways, parking spaces for working trucks and the center tracks, will provide for 50,000 tons of cargo, or 12,500 tons for each of the four berths. This is the equivalent of the largest cargoes carried by freight ships. The combined rail facilities will be capable of providing working space for 70 railroad cars at one spotting, and 120 parking spaces for working trucks are designed to avoid interference with the pier's cargo handling capacity.

Reviewing Some Special Details

Certain aspects of the proposed flow of cargo through the new Pier No. 4 deserve close scrutiny for a full appreciation of some of the provisions made in the over-all plan. Of particular significance is the fact that each of the four berths is designed to accommodate 12,500 tons of cargo, the maximum cargoes carried by the latest type freight ships. While each ship berthed will not discharge a maximum load, the ample pier capacity would make it possible, after one ship has moved out, to move another one into the same berth and to work it immediately. No ship would be kept waiting because the pier is loaded.

This phase of the proposed operation is also tied in with the fork truck handling program. It is anticipated that empty pallets will be placed in hatches for loading by stevedoring crews. Assuming an import operation, loads deposited on the pier would be transported by fork trucks to temporary storage, highway vehicles or a box car.

With an old-type pier of this length, assuming an export operation, the haul from the head of the pier to a ship's No. 5 hatch would be 950 feet. This point, made for illustration purposes only, brings out the validity of a criticism of long standing made about piers, also indirectly the advantage of the proposed design: as the pier space grows narrower the cargo must be

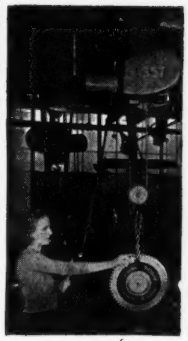
stowed at an increasingly greater distance from the ship's hatches. The resultant extra traffic means of course confusion, congestion and costly delays.

The cargo on the new Pier No. 4, however, would be stored in an area adjacent to each berth. This will tend to keep all fork truck travel at an economical minimum. For the same reason, tractor-train handling, used for longer hauls, will be employed to a lesser degree in this operation.

It is expected that pallets will be of the heavy (bolted) marine type. Box car freight will be worked by fork trucks and, where indicated, by tractor-trains on any point of the lower deck or direct to ships gear. Freight arriving in trucks will be palletized at the tail gates of the vehicles for subsequent fork truck handling. As illustrated in one of the photos, this will be done by placing a stack of empty pallets adjacent to the rear of each unloading truck, keeping the top pallet on a level with that of the end gate. The loaded pallets would be transported either to temporary storage or to the apron for immediate loading.

Crane trucks will also be included in the material handling facilities. Equipment of this type will be employed wherever large and bulky items will not be moved directly to railroad cars or to lighters offshore. Marine and other terminal operations include a certain amount of handling to which crane trucks are well adapted.

A few explanatory points about the proposed hoist handling will make clear the advantages of this part of the operation as now recommended in the Port Authority's report. The electric hoists covering the aprons on each side at intervals of about 150 feet will move import-export freight directly between lighters and pier. For example, a shipment of flour may arrive in lighters that is consigned to a ship not due to arrive until two days later. In such a case, it would ordinarily be necessary for the railroad to provide at some expense a stick lighter (a barge with a derrick) in order to move the flour from the lighters to the pier sheds. The hoists on the "I" beams, however, will do away with the need for the stick lighter; they would move the palletized loads of



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ELECTRIC HOISTS

- 250-, 500- and 1000-lb. Capacities.
- Hook, Bolt or Trolley Suspension.
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NEARLY NEW
3 CONVEYER SYSTEMS

All made of 18" wide Ferguson roller conveyor, with 10" wide Balata belting power driven over rollers by 220/440 V., 3 Phase, 60 Cycle motors. Complete with wiring and controls.

SYSTEM 1

1 56' 8" long horizontal units with 26' 0" Booster Unit from 29" above floor to 8' 2" above floor, complete with 1 H.P. Drive and Motor.
1 93' 0" long horizontal unit with lower run 29" height from floor and 60' 0" long upper level run 8' 2" height from floor with three manual diverters to three drop chutes. Complete with two 1 H.P. Drives and Motors.
3 166' 0" reversible horizontal units 29" height from floor, each complete with 5 H.P. Drive and Motor.

SYSTEM 2

3 190' 0" reversible horizontal units 29" height from floor, each complete with 5 H.P. Drive and Motor.
1 33' 0" Interlock horizontal units 29" height from floor, with 5 H.P. Drive and Motor.
1 70' unit with 10' 0" Booster, 10' 0" from one end from 29" to 4' 10" height from floor complete with 40' walkaway and 1 H.P. Motor and Drive.
1 Slanted gravity beltless accumulator table with five double 18" drops, 30' 0" long with foot treadle operated stops and releases and wood walks between sections. Drops from 4' 10" height from floor to 29" height.

SYSTEM 3

1 25' 0" horizontal unit 29" height from floor with ½ H.P. Drive and Motor.
1 43' 6" unit with 7' 0" Booster 10' from one end raising from floor to 7' 0" from floor with 1 H.P. Drive and Motor.
1 55' horizontal units 7' 0" height from floor, with 6 feed off chutes and hydraulic diverters, complete with 2 H.P. Drive and Motor.

Also have components, gravity conveyor and 4" beam trolley conveyor.

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HALLOWELL

TRUCKS of STEEL

Fig. 753
4-Wooden Stakes

Fig. 760
1-Bar Handle

Fig. 757
2-Bar Handles

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. . . and with minimum maintenance and repair. This sturdy, welded, splinter-proof construction insures against weak, loose joints, wobbly trucks and rapid wear . . . casters with free-rolling wheels make the "Hallowell" run easily, even under heavy loads. Types and styles—each a model of smooth-running durability—are available for every service. Write for your copy of the "Hallowell" Catalog, it describes them all.

"Unbrako" and "Hallowell" Products are sold entirely through Industrial Distributors.

Fig. 762
2-Pipe Stakes

Fig. 772
1 Rack

Fig. 751
4-Pipe Stakes

OVER 44 YEARS IN BUSINESS

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flour directly from the delivering lighters* either to the first or the second deck of the pier. When deposited at the required level, the flour would be transported by fork trucks to the storage area.

One word about the hoist operation on the second deck in the shedded area. At almost no pier in the world is it possible to take advantage of rail tracks on a lower deck in connection with working space on the upper deck, as proposed here. Thus this part of the hoist system, made possible by the floor hatches on the upper level, will represent a novel hoist application in freight pier handling.

Referring to the total facilities described in the foregoing paragraphs, the reader will have noticed that a ship will actually have four ways of disposing of import cargo. 1. Direct to a lighter offshore. 2. To the second deck to await truck pickup, using the pier's house masts or the ship's gear. 3. Directly into open-top cars spotted on the tracks running the length of the north apron. 4. To the lower deck to await truck pickup or for transfer by fork truck into box cars on the depressed center decks. The flexibility will of course be comparable in handling export cargo.

In terms of physical extent, number of scheduled sailings and volume of foreign cargo handled, New York is the world's greatest port by a wide margin. Since 1929 it has handled between 40 and 50 per cent (by value) of the nation's foreign trade. But frequent scheduled foreign sailings (between 400 and 500 a month) do not constitute a reason for resting on one's laurels, Port Authority representatives are well aware. They know full well that a large percentage of complaints from manufacturers and other shippers can be traced to difficulties resulting from outmoded piers designed for the horse-drawn era. The Port Authority is prepared to build the new Pier No. 4 in the interest of increasing terminal efficiency.

A ship is earning money only when transporting its cargo at sea. The steamship operator pays dockage for the berth at a per diem rate of roughly $200 (three cents per gross registered ton). With a promise of minimum turnaround time, operators stand to gain importantly from the new development. And shippers and owners of cargo will similarly benefit. The latest type of facilities and efficient methods give assurance that costs will be reduced and that such odious penalty charges as truck waiting time will disappear entirely.

Thus the new Pier No. 4, when authorized and completed, will meet several urgent needs. For one thing, it will represent a step on the part of marine terminal operators to match pier design with the tremendous advances in ship construction over the past 10 years. Further, it is hoped that the new pier will provide a stage on which the most advanced material handling equipment can be applied to the best advantage of all concerned —the cargo owner and shipper and steamship operator.

***While a detailed discussion of the New York port's lighterage system has no place in a material handling article, this footnote is given to clarify frequent references to the subject. With practically all foreign freight moving to and from ships to the eight railheads located in New Jersey and the Bronx, New York is the greatest lighter port in the world. The lighter movement is provided free by the railroads on carload lots. While critics of this method (from other ports) point out that lighter handling requires extra time, proponents of the system emphasize that, unlike in a direct freight car-to-ship movement, the lighter method permits both sides of a ship to be worked at the same time, offshore as well as inshore. This simultaneous two-side operation is said to compensate fully for the time consumed in lighter transfer. And the exceptional flexibility obtained because of water access to every pier is also said to contribute to minimum turnaround time.**

The vastness of the New York port, in turn, is the physical condition that has given prominence to the lighterage system. Consisting of eight large bays and four straits, the Port District covers an area of about 1520 square miles, 431 of these under water. Of the 651 miles of waterfront on navigable channels, 23 miles along this stretch have deep-sea piers. Thus the Port of New York, anything but a single waterfront or waterway, is a conjunction of many harbors and a combination of channels.

This physical condition has also affected the design of cargo ships (in conjunction with the lighterage method). As shown in one of the reproductions on these pages, these ships are equipped with double cargo masts (king posts), permitting two crews in each hatch to work both sides simultaneously—to and from the lighters and the piers.

SMALL SPACE—BIG VOLUME ...

(Continued from page 35)

After dehydration and cooling, the units are transferred to the west-east line, where the overload and relay are added. Continuing their travel east on a roller conveyor, the compressors arrive at the charging board, where the proper charges of oil and refrigerant are added. The line extends into the soundproofed test room, where final and complete operating and quietness tests are performed. From the test booth, two gravity roller lines extend into the adjacent shipping room, where the units arrive on a transverse section of roller conveyor which is 30 feet long. Here the compressors are sorted and then placed on pallets for shipment by highway trailers.

A 42″ x 48″ pallet was adopted since two pallets of this width can be placed side by side in highway vehicles. By use of plywood separator trays, the compressors are stacked on the pallet base four layers high, 12 compressors of medium size to a layer. Two bands of ¾-inch steel strapping secure the load, and the bands are tensioned over a piece of 2″ x 4″ lumber.

Pallet handling of the finished product has enabled the company to increase its packing and shipping production in keeping with the high-volume output of the mechanized assembly line. Prior to palletizing, the compressors and units were packed in individual cartons. This required a large number of packers to set up and tape the containers, and handlers to transport and load the units into highway trailers and railroad cars. With palletizing, it has been possible to handle the increased production with the same number of packers and truckers. The loaded pallets are run by fork trucks into the outbound vehicles.

The empty pallets are returned to Tecumseh Products Co., and, if in usable condition, credit is issued to the customer. In addition to the economy in handling, both at Tecumseh and in the customer's plant, there is an actual saving of more than 25 percent in the overall cost of packing in cartons. The product arrives at destination with a minimum of damage.

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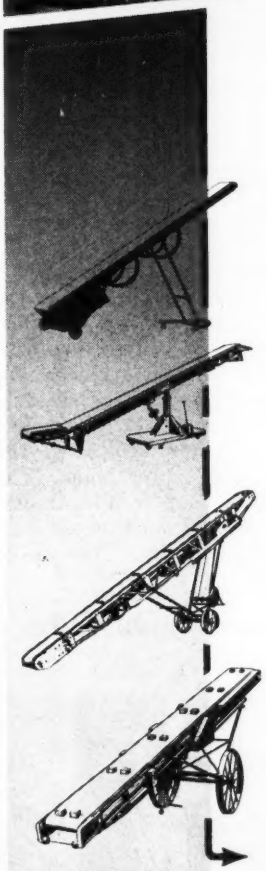
save handling costs . . .

Freight-handling costs less when Farquhar Conveyors work for you. They move material *fast* and efficiently, cut man-hours to a minimum. Four types to fit your needs.



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Versatile model for package and bag handling, car and truck loading, "boosting" in a conveyor line. Length: 10 feet. Belt: 12 inches.

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Easily moved by one man. For stacking, boosting or loading packages up to 150 pounds. Lengths: 14′ and 17′. Belt: 16″. Can be equipped with wheel-type truck.

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For packages up to 300 pounds. Mounted on horizontal and elevating wheels or caster or for permanent installations. Length: 14′ to 32′. Belt: 16″ and 24″. Can be mounted on Fleximount Truck.

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Handles packages up to 500 pounds, in either direction. Horizontal or elevating. Lengths 17, 22, 27, 32 ft. and longer. Belt 24″ and 30″.

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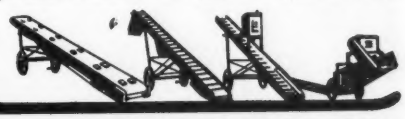


PORTABLE MACHINERY DIVISION

A. B. FARQUHAR CO.

206 NORTH DUKE ST. YORK, PA.
616 WEST ELM STREET CHICAGO 10, ILLINOIS

300% More Gravel . . .

(Continued from page 24)

terial is delivered by a sand-sucker of 1850 cubic-yard capacity. This type of ship "dredges" the aggregate materials by use of centrifugal pumps, whereas a dredge operates with a bucket or bucket elevator. The slip is on the east side of the dock, on which an 800-foot track extends for operation of a steam-powered crane which loads hoppers and gondola cars. (A similar crane operates in the center of the dock and loads aggregates into the hoppers of a ready-mix plant.)

The sand-sucker, the s/s Joseph S. Scobell, obtains the sand from Lake Erie, operating in the area between Detroit and Buffalo. A specially designed hydraulic screen, patented by the company, permits the grading to be done on the ship. Undesirable material is eliminated by plate screens and sluiced back to the lake. The wetness of the material poses an interesting problem in the unloading operation.

While the s/s Scobell is a self-unloading ship, the conventional pan-type conveyor in a tunnel below the cargo hold could not be used, as is done in ships transporting such dry bulk materials as limestone or coal. The Erie Sand and Gravel Co. solved the problem with the installation of a mobile crane, mounted aboard on 20-foot-wide rails that straddle the cargo hatches. The machine has a 40-foot boom and a 1½ cubic yard capacity bucket. It operates in conjunction with track-mounted hoppers and a deck conveyor, both installed on the starboard side of the ship.

HOW SAND MOVES ASHORE: Closeup shows the deck belt receiving sand through one of two mobile hoppers.

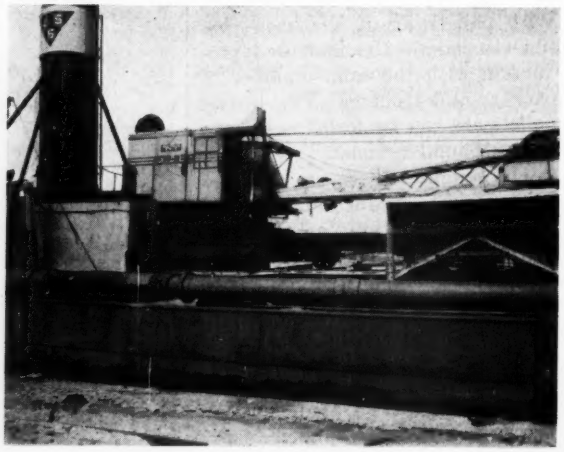
The crane is propelled on the 125-foot-long track by a winch fore and aft in conjunction with ⅞" cables and snatch blocks. For unloading, the clamshell deposits the sand into one of the two mobile hoppers, which are spotted for the shortest swing of the boom. The use of two hoppers also insures that the boat will be on an even keel during unloading. The use of two hoppers is also a time-saving feature, since it makes it unnecessary to respot one hopper frequently during unloading.

The material from the hoppers travels forward on the 36-inch by 128-foot deck belt. It discharges to the unloading boom via an inclined shuttle belt. The ship's boom has an over-all length of 115 feet and a 30-inch endless belt on troughing rollers. In this manner sand is discharged to the stock-piles on shore.

If the material is gravel it is delivered direct, through a hopper, to the overhead belt line that feeds

OVER THE BOOM: Its 115-foot troughed belt delivers aggregates to shore, also to screen house.

SAFELY LASHED: At sea, the crane is lashed with stout wire rope alongside the aft deckhouse.



the gravel classifying plant. Over the same system, incidentally, sand can also be delivered, by by-passing the screen house, to the front part of the extensive yard area. This will be indicated later.

While out at sea, the crane is lashed down with a 7/8-inch steel cable in the aft end, and bolts secure it to the track in heavy seas. Thus nestled beside the deck house, the heavy machine is scarcely noticeable as the "land lubber" type of equipment for which it was originally designed. At sea, the clamshell bucket is lashed in a convenient location over the pump room.

Average unloading time for 1850 cubic yards from the s/s Scobell by means of the clamshell, deck belt and ship's boom combination is about 7½ hours. You can see that the "shore" equipment can do an economical job by holding in-port time to a minimum.

Ship-to-Shore Coordination

The gravel classifying plant is located near the center of the dock, and its receiving hopper is accessible to the boom of the s/s Scobell. The material is classified according to two main grades—pea gravel and commercial gravel. This operation involves the conveyor system mounted on 30-foot-high trestles and with a combined length of more than 400 lineal feet.

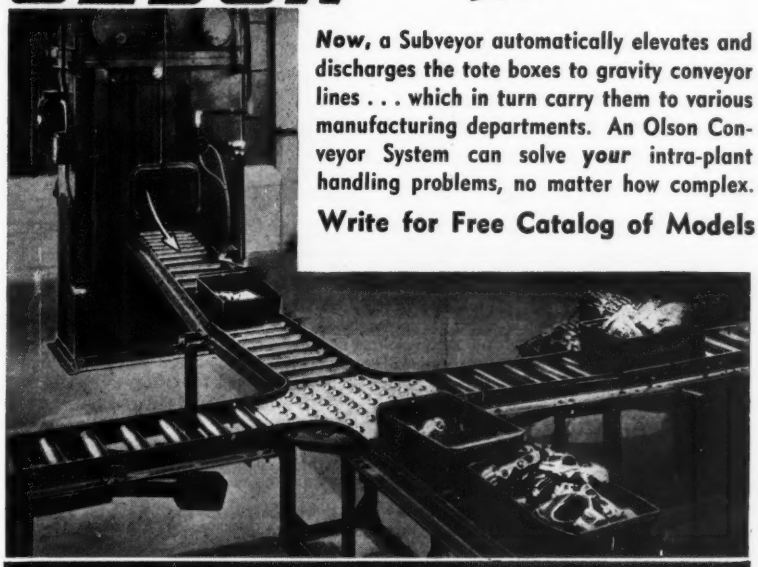
As indicated previously, gravel from the ship is unloaded directly to a hopper installed over a belt that feeds to the classifying plant. Oversize material is chuted back to a gyratory crusher, whence a bucket elevator returns it to the screen. This belt line is 30 inches by 60 feet.

The pea gravel is delivered by a troughed belt from the screen to storage at the northeast end of the classifying plant, also approximately a 60-foot line 24 inches wide. The ¾-inch commercial gravel is delivered to the stockpile by two belt sections (30-inch) running at right angles to each other and with a combined length slightly over 100 lineal feet. These discharge the material on the stockpile northwest of the classifying plant.

A certain amount of sand produced in this operation is delivered from screening to the south end

This was a back-breaking, time-consuming job...before the

OLSON CONVEYOR SYSTEM took over!



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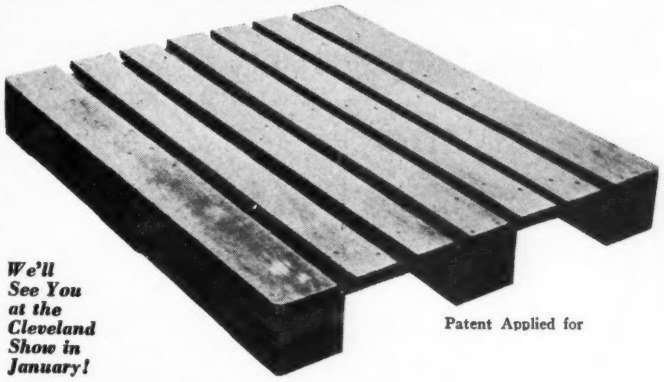

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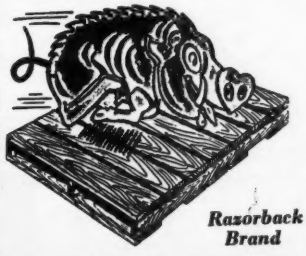

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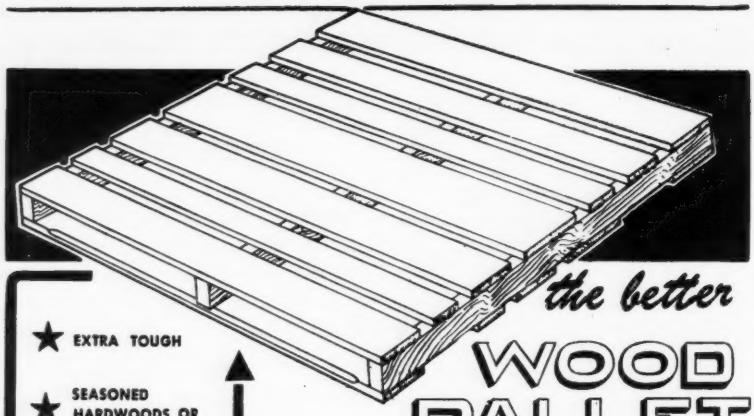
ARKANSAS PALLET CORP.

Plant in Pine Bluff, Arkansas
Sales Office: Box 153-A, Pul. Hgts. Sta.
Little Rock, Arkansas. Phone 3-9133



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PS PALLET SYSTEMS

PALLET SYSTEMS, Inc.

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of the yard on a 30-inch belt line by 200 feet. If necessary, the system can be used for routing sand directly from the s/s Scobell to the stockpiles at the far south end of the yard. In that case, the material is by-passed through the screenhouse.

Thus the Scobell's conveyor boom can deliver the material directly to the shore processing and/or storage installation, with the thousands of tons being routed, without intermediate handling, to the several locations.

Hoppers are spotted about the yard for dump truck loading, and the hoppers are loaded by a track-mounted crane. The latter operates with a 1½-yard cubic yard capacity bucket and is also used for auxiliary purposes in areas beyond the reach of the previously mentioned track-mounted cranes operating on the dock.

Prior to installation of the conveyor system, all handling was completely by intermittent methods. The s/s Scobell can get only to the middle of the dock. If the ma-

● This plant was and, even with supplemental fixed type material handling equipment, could utilize only a portion of the available storage space. But with the addition of this Lorain Self-Propelled Crane the storage area has been extended greatly and the only limit to further expansion is the property line.

Lorain Self-Propelled Cranes are available on 4 or 6 wheel rubber-tire mountings, are single-engine powered and one-man operated; can travel at speeds up to 7 M.P.H.; feature air steering for easy maneuvering and may be used with any one of 15 different crane attachments to handle a wide range of materials. For complete information, call or write your local Thew-Lorain distributor.

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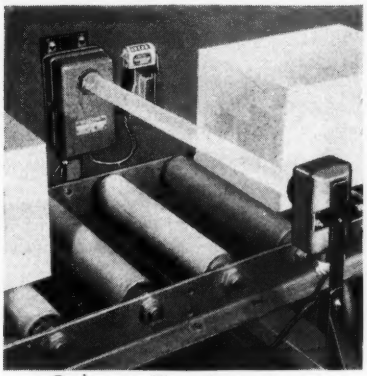
LORAIN CRANE HANDLING *VS* MAN HANDLING *SAVES MONEY*

terial was to be advanced south, the track-mounted crane on this side of the dock could do so only by the length of its boom. A good many hours were necessarily involved in bringing the material to the required point. Now, however, the delivery from the ship to the point of use (through processing) is a one-time, continuous operation. Existing yard equipment can be utilized to best advantage for speedier loading of the tripled volume produced today.

Don't Wait Too Long

December 15 is the deadline for papers submitted in the current FLOW cost reduction contest. Entries reaching us after this date will not be eligible for the $1,500 prize money awards. See page 9—send in your paper only.



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offers a compact unit for remote control operation . . . a ruggedly constructed electric counter that may be placed at any desired location . . . and a specially designed moisture-proof photo-electric control and light beam. Each object interrupting the light beam is registered on the counter.

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to operate: drives tacks one-hand as fast as you can squeeze handle. Holds scores of tacks at one loading.

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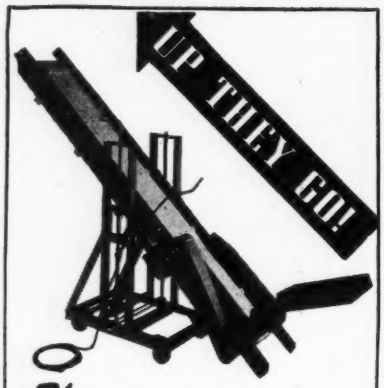

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NEWS FROM THE Sales FIELD

NOOK AND O'NEILL, INC., Cleveland: H. H. Harrington has been added to sales force of Nook and O'Neill, Inc., distributors of materials handling equipment. Prior to his new connection, he was associated with the industrial storage battery division of Philco Corp., of Philadelphia.

NEW HOLLAND MFG. CO., Mountville, Pa.: A new district manager, Franklin M. McCorkle, has been named for Ohio, Kentucky, Michigan (except the upper peninsula), and Tennessee east of the Tennessee River. His office is in Columbus, O.

COLBY STEEL & ENGINEERING CO., Seattle: A Navy officer in World War I and an Army transport officer in World War II, Nelson J. Leonard has been placed in charge of the Elwell-Parker account. He will direct the sales activities for trucks, tractors and cranes.

KELLER TOOL CO., Grand Haven, Mich.: The Los Angeles branch, with W. A. Nilsson in charge, is now located at 507 West Washington Blvd., there.

R. G. LeTOURNEAU, INC., Longview, Tex.: George C. Tracy is temporarily in charge of the new division offices at 5007 East Washington Blvd., Los Angeles. He will return to Longview after a permanent manager has been named.

JOHN G. KURTZ & ASSOCIATES, Weehawken, N. J.: Sales and service of materials handling equipment exclusively has been started at its new building, 363-5 Park Ave., Weehawken, N. J., John G. Kurtz announced. Engaged in the materials handling industry since 1915, the firm was formerly located in Hoboken.

HEWITT-ROBINS, INC., Hewitt Rubber Division, Buffalo: McJunkin Supply Co., of Charleston, W. Va., has been named distributor of the entire Hewitt line of industrial hose, belting and packing. Headed by H. B. Wehrle, president; George S. Herscher, vice president, and J. H. West, purchasing agent, the company has a sales force of 18 men and operates sales and warehouse facilities in Allen, Ky., Hamlin, W. Va., and Marietta, O. The company handles supplies for coal mining, oil, gas and general manufacturing industries.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $3.50 minimum, limit 25 words. For all other classifications $3.50 minimum for 25 words, each additional word 10c; boldface type or all capitals, $6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

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Well established wholesaling concern has excellent opportunity for WAREHOUSE MANAGER. Applicant must be organizer, familiar with warehouse control and time study. Alert, congenial, and capable of handling and demanding respect of men under him, familiar with receiving, shipping procedures, and streamlined warehousing. Liberal salary commensurate with applicant's past record of achievement and ability in obtaining effective results in the above prerequisites pertaining to this position. Write full particulars to:

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Nationally known, long established conveyor manufacturer requires services of a seasoned conveyor engineer. The man selected will have an engineering degree or its equivalent, and at least 10 years' successful experience in design and layout of mass production conveyor systems. This is an excellent position with very good future possibilities for a capable man. Plant located in Detroit area. Our employees know of

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Manufacturer of nationally advertised line of equipment and supplies wants manufacturer's representative for a number of exclusive areas. Fast moving, good repeat business. Representative must contact shipping departments. A good opportunity for the right man to secure a permanent and exclusive line. Write stating number and type of lines now sold.

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We manufacture Casters, Rubber tired and metal Wheels, and Barrel trucks. We require representatives who will handle our line in an exclusive territory. Only men who expect to work their territory energetically and regularly by personal calls on prospects need apply. Closed territory assigned on strictly commission basis. Advise us territory you cover and name of every manufacturer you now represent.

Box No. 4047

SALESMAN WANTED

Large caster manufacturer has opening for young salesman about 30, with some mechanical engineering background, to represent them in the Cleveland area. Unusual opportunity for permanent position. Materials handling experience preferred. Salary. Box 6047, FLOW.

FACTORY PRODUCTION MANAGER WANTED

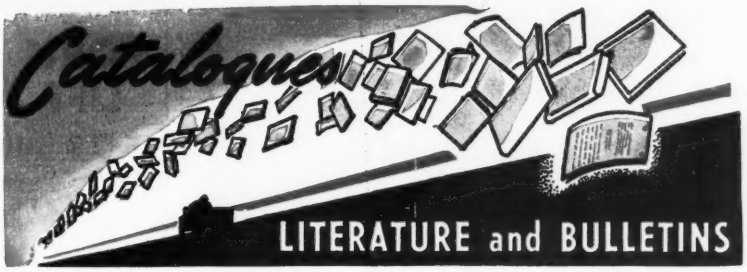
"WANTED—Factory Production Manager. Must be wide awake, not afraid of work, able to get the best out of help and willing to cooperate with factory superintendent, chief engineer and general manager. Must have general knowledge and at least five years experience manufacturing gravity, belt and chain conveyors for cases, packages and bottles. A real opportunity for the right man. Give full details of experience and salary expected. All replies held in strict confidence. Box 7047.

DISTRIBUTOR WANTED

Distributor wanted for Buffalo, New York Territory, to handle nationally known line of Electric Hoists and Cranes on commission basis. Engineer preferred. Advise qualifications and lines handled. Box 8047.

INDUSTRIAL ENGINEER WANTED

WANTED—Industrial engineer trained and experienced in manufacturing, process charts, flow diagrams, process engineering, materials handling, storage and warehousing, plant layout, etc. Apply Box 9047 giving full particulars.



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

380 — Packing and Carloading Check-Chart . . . "The Easy Way to Check Packing and Carloading Bracing Costs", a simple form, has been issued by A. J. Gerrard & Co. to provide a quick, accurate analysis of present shipping costs and the dollars-and-cents difference saved by using the Bulkbinder method of steel-strapping. Catalogs listing strapping, sealers, seals and accessories are also available.

381—Packaging Systems . . . Case History No. 16, an illustrated folder describing an installation of a St. Regis Packaging System used by a non-metallic minerals processor, is ready for distribution. It tells how modern packaging is keeping the product clean and relatively free of moisture.

382 — Herringbone Gear Reducers . . . Many new sizes and types of enclosed herringbone gear units for speed reducing and speed increasing service are detailed in the new 68-page book prepared by Link-Belt Co. The book includes engineering information, reducer selection data, examples of proper application, lubrication data and maximum load tables.

383—Shipping Containers . . . An illustrated folder describing the 276-cubic foot capacity, weathertight welded steel shipping containers developed by Dravo Corp. to facilitate material handling and minimize pilferage losses in marine, rail and motor transportation, is now available. It describes construction details and various ways in which the containers can be utilized to carry many different types of merchandise.

384—Lift Truck Guide . . . A 28-page pocket size guide to help in the selection of correct fork lift truck, industrial tractor or fork lift truck accessory has been issued by Towmotor Corp. The booklet contains drawings, illustrations and important specifications for each of the company's models and accessories.

385—Dewatering Device . . . Link-Belt Co. has issued a four-page folder describing its Dewatering Rotoscoop for recovering grains of sand and other materials, of sufficient fineness to meet specifications, and discharging the product dry enough to permit mechanical conveying or truck transportation.

386—Elevating Tables . . . A new eight-page bulletin describing portable hydraulic elevating tables has been announced by LYON-Raymond Corp. Tables are shown in actual use for die handling, strip and sheet feeding, work positioning, loading trucks and other jobs.

387—Management Checklist . . . "Progress in Scientific Management—1945-47", made available by American Management Association, is a checklist of publications reporting progress in business and industrial management since World War II in personnel and industrial relations, office management, production, marketing, financial management, insurance, packaging and general management.

388—Machine Glue . . . Complete instructions for handling machine glue for use in cigaret tax stamping machines as well as re-sealing the cartons are included in a publication issued by National Adhesives. The booklet makes recommendations for storage and handling of the glue.

389—Pallet Systems . . . A 16-page bulletin issued by Barrett-Cravens Co. describes various types of equipment for use in pallet systems. It also contains pallet designs to fill the requirements of many plants and industries. Illustrations show various types of lift trucks used in the pallet systems.

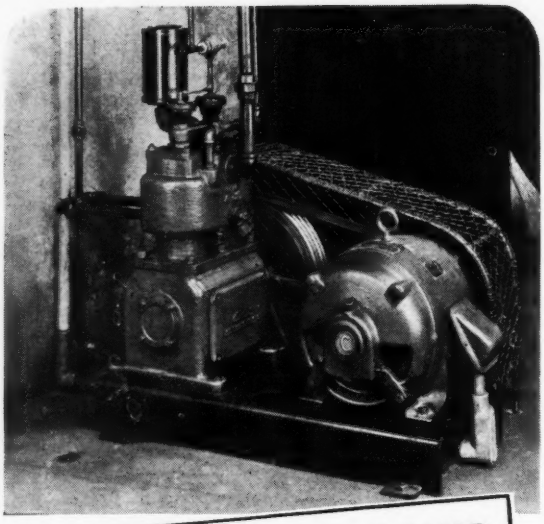
390—Material Dumpers . . . A folder describing equipment developed for lifting and dumping free flowing materials such as sugar, flour, nuts, fruits, powdered or liquid milk, chocolate, chemicals and many light industrial products, has been made available by Colson Equipment and Supply Co.

391—Gravity Conveyors . . . Harry J. Ferguson Co. has issued a 12-page bulletin showing its line of Streamliner gravity roller conveyors, specifications and suggested uses in various industries with material handling problems.

392—Paper Pallet Support . . . A circular describing a paper pallet support for efficient gluing and banding unit loads is available from Moffat Steel Co. The support is designed to give an expendable pallet all the characteristics of a permanent pallet during loading operations.

393—Tool Trolley System . . . Extension of the use of overhead trolley system to portable tools, testing equipment, lights and other special applications is described in a 24-page catalog offered by Feedrail Corp.

394—Overhead Trolley . . . An eight-page folder describing engineered ball bearing trolley for overhead conveyors has been published by Link-Belt Co. It gives dimensions, weights, ratings, prices and other data for selection of the proper trolley for service.



CURTIS AIR COMPRESSOR

After 27 Years of Service—Replaced by Curtis Timken Bearing Compressor

THE record of 27 years of dependable service operating tools and keg testers for a nationally known cooperage company is a real tribute to the long, trouble-free life of Curtis Air Compressors. During these years, *clean, oil-free* air was essential and the company enjoyed completely satisfactory service from their Curtis unit.

For the most dependable, efficient and economical supply of air, you can depend on Curtis Air Compressors year after year. Engineering advantages include:

- Timken Bearings
- Carbon-free disc valves
- Positive pressure lubrication—self-oiling
- Automatic pressure unloader
- Fully enclosed
- Precision built

Write for full information on Curtis Air Compressors, Air Hoists and Air Cylinders.

CURTIS PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Company
1909 Kienlen Avenue, St. Louis 20, Missouri

CURTIS PNEUMATIC MACHINERY DIVISION F567A
of Curtis Manufacturing Company
1909 Kienlen Avenue, St. Louis 20, Missouri
Please send me Form C-7 on Curtis Air Hoists, Air Cylinders and Curtis Air Compressors.

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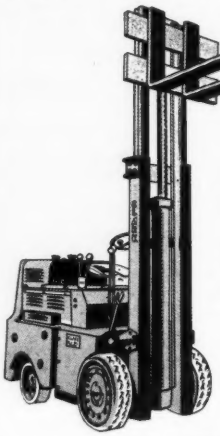
Firm.....
Street.....
City.....*Zone*.....*State*.....

93 Years of Precision Manufacturing

FORK LIFT TRUCKS

FOR IMMEDIATE SALE



AT NEW LOW PRICES

10—Clark ELECTRIC FORK Trucks, 6000 lbs. capacity, 104″ or 144″ lift, 42″ Forks.

35—Clark GASOLINE FORK Trucks, 6000 lbs. capacity, 104″ or 144″ lift, 42″ Forks.

5—Towmotor GASOLINE FORK Trucks, 10,000 lbs. capacity, 72″ lift, 42″ forks.

ALL TRUCKS ARE IN 1st CLASS CONDITION

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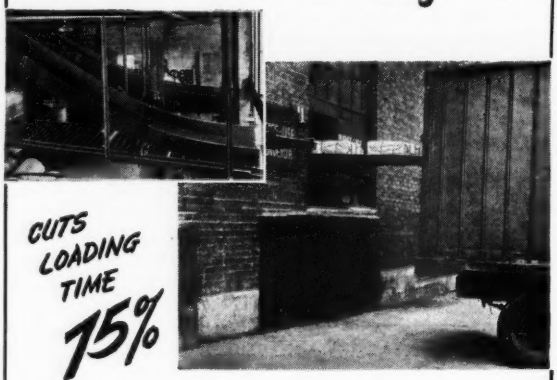
BETTER HANDLING "In The Bag".....



CUTS LOADING TIME 15%

This Buschman customer—Security Bag Division, The Fox Paper Co., Lockland, Ohio—testifies to the amazing savings produced by their Buschman Slides and Retractable Sections of Roller Conveyor. Trucks which formerly took 3 to 4 hours for loading are now filled in 45 minutes to 1 hour. Let us prove the advantages of Buschman Conveyors. Write for Bulletin 10.

Winton Place Cincinnati 32, Ohio

The E. W. BUSCHMAN Co.

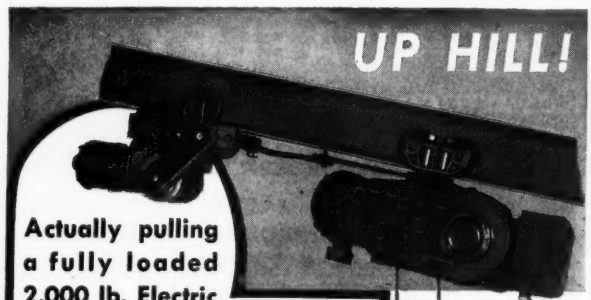
ON THE PALLET . . .

(Continued from page 36)

strength, withstanding shock and gouging, and resisting heat, weak acids and alkalies.

LATEST equipment for brewing, packaging and transporting brewery products was seen by more than 5000 representatives from all over the world at the 60th Convention and International Brewing Industries Exposition in Cleveland last month. Over 100,000 square feet of floor space was devoted to the 140 exhibits. Technical sessions were featured by papers on product improvement, research and plant management.

PHYSICALLY impaired workers, according to Department of Labor studies, are giving a better account of themselves on jobs than non-handicapped men and women. These facts were revealed during last month's drive to obtain jobs for handicapped persons: 51 percent of handicapped employees had better safety records, 38 percent had the same safety records as non-disabled personnel and only 11 percent had poorer accident records; 58 percent stay at jobs longer while 31 percent have average records for turnover; and 49 percent had better than average attendance records, 44 percent average, and 7 percent below average.



Actually pulling a fully loaded 2,000 lb. Electric Hoist up a 5% grade . . . .

New Trojan TRACTOR

The *TROJAN TRACTOR* can be applied to *TRAVEL* . . .

1. Present hand travelled monorail hoists.
2. Existing hand travelled crane bridges.
3. Monorail conveyor lines.
4. Open and Close garage and hangar doors.

You probably have slow, hand propelled units which the Trojan Tractor can move by power,—faster and economically. Let us know what they are; we will give you the details.

DETROIT HOIST & MACHINE CO.

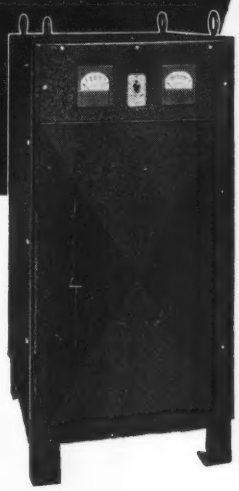
8216 MORROW ST.

DETROIT 11, MICH.

FULLY AUTOMATIC

TRUCK BATTERY CHARGING...

GET THE COMPLETE STORY!



Plug it in, turn the time switch, and the Westinghouse Rectox Rectifier takes over completely. Easy to move—installs anywhere there is an a-c power outlet—no special foundations or wiring.

Rectox is foolproof. It handles rates of charge, timing, blocking of "flow-back" or leakage from the battery, automatically. High, full-load efficiency is maintained to as low as 25% of full load. For that reason, its economy of operation is excellent.

Streamlined plant traffic operation is a natural, with Rectox unit charging stations moved "on-the-job" . . . the exact spot where regular, foolproof charging is needed. More than sixteen years of successful service assure the dependable operation of Rectox Battery Chargers. For complete information, call your nearest Westinghouse office or write WESTINGHOUSE ELECTRIC CORPORATION, P. O. Box 868, Pittsburgh 30, Pa.

J-21399-A

Westinghouse

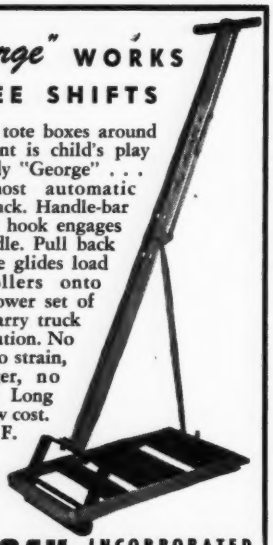
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

RECTOX

COPPER-OXIDE RECTIFIERS

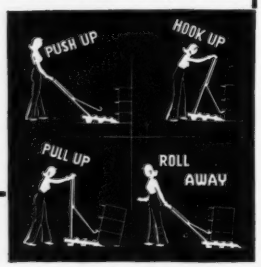
"George" WORKS THREE SHIFTS

Hauling tote boxes around your plant is child's play for sturdy "George" . . . the almost automatic roller truck. Handle-bar activated hook engages box handle. Pull back of handle glides load over rollers onto truck. Lower set of rollers carry truck to destination. No lifting, no strain, no danger, no exertion. Long life ... low cost. Bulletin F.



ROLOCK INCORPORATED FAIRFIELD, CONN.

LET "George" DO IT / TRADE MARK



DOUBLE THE SAVINGS . . .

(Continued from page 23)

livers a load, the returning vehicle takes back a load of empty boxes. Thus the containers are kept in circulation, and the vendors constantly have a supply on hand.

Vendors Benefit Too

Yes, the savings created by the new method *are* astonishing, to repeat Superintendent Mattie's statement. There is a saving in effort, time and cost in every move—receiving, storage, and supply to production.

Of course, the operating improvements also apply to the vendors, and hence the "savings can be multiplied by two." At the end of the production line, the stampings are loaded into the crate-type boxes. Subsequent piece-by-piece handling is avoided because the containers are stacked in the outbound vehicles. Thus, what was said about the reduction of unloading time also applies to the loading operation. Truck waiting time at the user's plant is cut to an irreducible minimum. The vendor also has the advantage of space economy in storage, as well as improved housekeeping and a safer operation.

In view of the very substantial economies effected, it is no wonder that the initial investment paid for itself in a matter of months.

HURRY, HURRY!

The current FLOW cost reduction contest closes December 15. Don't miss getting your share of the $1,500 prize money by sending in your paper late. Some papers have been sent us weeks ago. You have ample time to finish yours, but don't put it off until you miss the deadline. Better complete it now that you think of it. See the full-page announcement on page 9.

NATIONAL PALLETS Everywhere!

All NATIONAL pallets are guaranteed for flawless construction. Each pallet made of moisture controlled hardwood at the source of lumber supply—and expertly assembled with hardened-steel drive screws. NATIONAL pallets will last longer under industry's toughest demands.

RUGGED

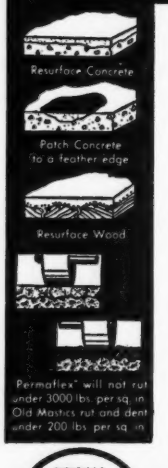
Industry's largest users specify *rugged* pallets from NATIONAL—the country's largest pallet manufacturer. NATIONAL supplies the engineering and design know-how for any and all types of materials handling programs.

Write or wire for descriptive literature

NATIONAL PALLET CORPORATION

MAIN OFFICES OLIVER BLDG., PITTSBURGH 22, PA.

Use "PERMAFLEX" Resurface and Patch INDUSTRIAL FLOORS


Resurface Concrete
Patch Concrete to a feather edge
Resurface Wood
Permaflex will not rut under 3000 lbs. per sq. in. Old Mastics rut and dent under 200 lbs. per sq. in.

HARD MASTIC
HEAVY DUTY • DUSTPROOF • WATERPROOF
FIRE-RESISTANT • RESTFUL • QUIET
SLIPPROOF • SANITARY

Install "PERMAFLEX" any thickness required over the old or new Floors, Walks or Drives. . . . Bonds perfectly—never comes loose, 3,000 lbs. pressure per square inch, will not rut. . . . Outwears any other known flooring.

For interior or exterior use. . . . Floors installed on Friday night and Saturday are ready for use Monday. . . . No chipping. . . . No dust. . . . No production delays. . . . No need to move machinery . . . finish right up to it.

IF DESIRED, OUR CONTRACT DEPARTMENT WILL INSTALL "PERMAFLEX" FLOORS FOR YOU UP TO 30,000 SQUARE FEET PER DAY. More than 500 leading Industrial plants use "PERMAFLEX" . . . including U. S. Steel, Bethlehem, Republic, General Motors, A. O. Smith, Remington Arms, Anaconda, Western Electric, Westinghouse, Bush Terminal, leading Railroads . . . and never a failure in more than 1000 installations.

Test 100 square feet — be convinced.

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INSTALL COMPLETE 12½c per square foot

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DETROIT.....6432 Case Ave.—Phone Madison 6300
NEW YORK..100 W. 42nd St.—Phone Wisconsin 7-5474
SAN FRANCISCO..1 Drumm St.—Phone Garfield 3198
SPRINGFIELD, MASS..214 Birnie Ave.—Phone Springfield 7-3512
BUFFALO....1200 Niagara St.—Phone Garfield 4866
ST. LOUIS.....826 Clark Ave.—Phone Main 4027

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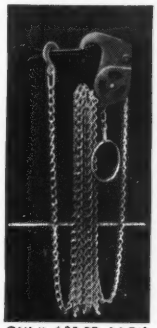
SAFER—FASTER BETTER way to open balky box car doors!

MONARCH ONE MAN CAR DOOR OPENER



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One man can open the most binding, balky box car door with the Monarch Car Door Opener. Get greater safety . . . speed loading and unloading schedules . . . order an ample supply to fill your needs today!

- No strained muscles. No slips or falls. No broken arms, legs or mashed fingers. No fatalities. No time wasted. No "gangs" needed. No time loss.

Write for free descriptive literature.

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LIGHTWEIGHT SHIPPING PALLETS or

HEAVY-DUTY WAREHOUSE PALLETS...

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MATERIALS HANDLING EQUIPMENT

Designed to do Specific Jobs Better

Combination TRUCK and DRAIN RACK

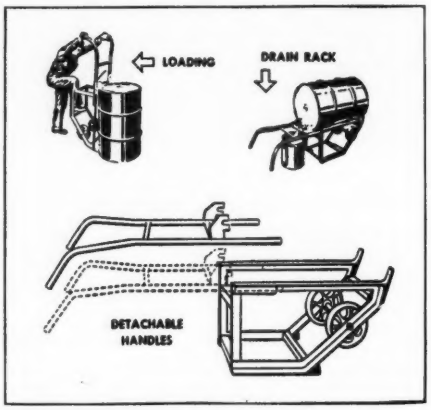
Loads Automatically

Weighs only 90 pounds, yet handles barrels weighing up to 1,000 lbs. with surprising ease. Sturdy frame, free rolling wheels and proper balance make light work of trucking the heaviest drums . . .

Tilt truck against drum, drop sliding steel grip over top of rim—rock truck back to wheeling position and loading is automatic.

To use as drain or storage rack detach handles to conserve floor space. Slight downward push on truck handles raises wheels and lays rack on floor in convenient draining position. One pair of handles will serve any number of trucks.

Heavy angle iron frame, tubular handles, all welded construction.



TWO STYLES

With and Without Detachable Handles

Item NS-506 (Handles welded to frame)	$42.50
Item NS-506 DH (Truck Complete with detachable handles)	44.50
Item NS-506 R (Item NS-506 DH without handles)	32.50
Item NS-506 H (Detachable handles only, for use with NS-506 R)	12.00

Order by "Item" number. Prices F.O.B. Detroit. Weights approximate.

Barrel and Box Grab

Item NS-288 $55.25

For picking up any wood or steel barrel, box or container, 40" diameter or less. 2000 lb. capacity. Rigid toggle construction. Weighs 35 lbs.

Drum and Barrel Sling

Item B-205

$15.00

Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Weighs 8½ lbs.

Carboy Truck

Item B-488 M

$38.00

Item B-488 R

$42.00

Gripping yoke makes loading automatic. Hardened steel studs grip load—no slipping. All steel welded construction—20" wide, 48" in length—capacity 500 lbs. Wt. 75 lbs.

Barrel Truck

Item S-911-M

$33.50

(Metal Wheels)

Item S-911-R

$38.50

(Molded-on rubber wheels)

Automatically loads barrels up to 1,000 lbs. Heavy tubular welded construction—sliding grip. 22" wide—wt. 85 lbs.

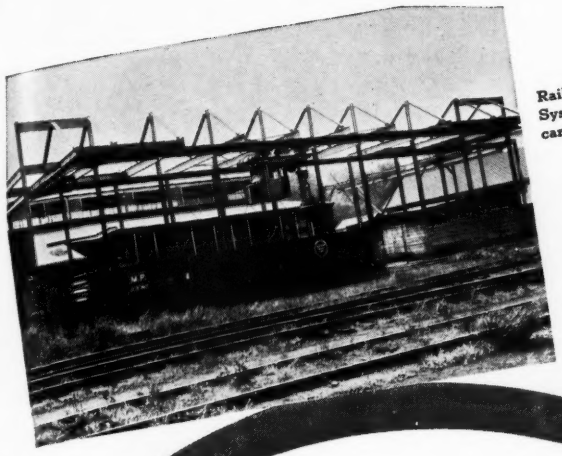
Barrel and Box Skid

Light, sturdy, all steel welded construction. Handles heaviest barrel or box. 14" wide.

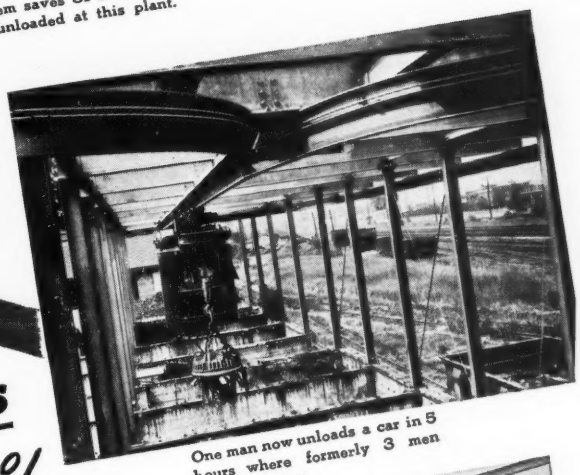
Item B-470-8 (8 feet)	$22.00
Item B-470-10 (10 feet)	27.50
Item B-470-12 (12 feet)	33.00

Palmer-Shile Co.

16012 Fullerton Avenue — Detroit 27, Michigan



RailMaster 5-Ton MonoRail System saves 31 hours for each car unloaded at this plant.



One man now unloads a car in 5 hours where formerly 3 men took 36 hours.

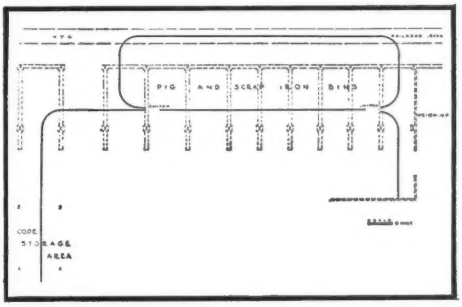
Handling Costs Reduced 86% with AMERICAN MONORAIL

American MonoRail System also used for storing copes and breaking scrap with 1000 lb. steel ball.

At this plant it formerly took 3 men appoximately 36 hours to unload and store a car of pig or scrap iron. With the American MonoRail system one man now accomplishes the same job in 5 hours.

The savings in time is just part of the story since the system is used for breaking scrap as well as storing copes.

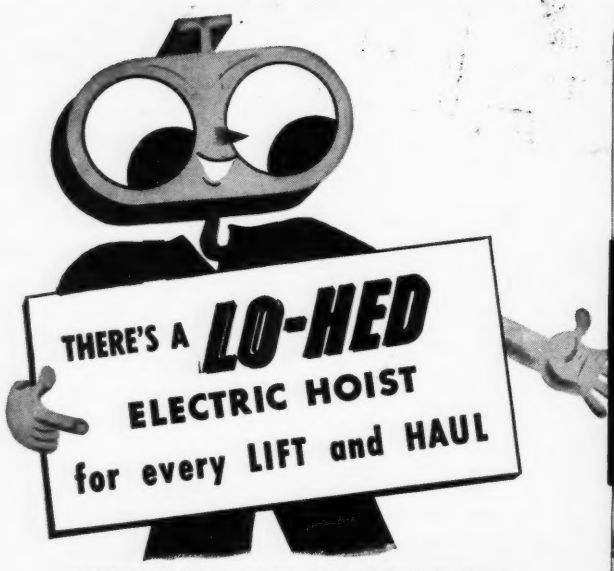
American MonoRail engineers often prove marked reduction in handling costs. They have hundreds of cases from which to draw. A consultation can be quickly arranged.



SEND FOR BULLETIN C-1. A 56-page book showing successful applications of American MonoRail Systems.

THE AMERICAN MONORAIL COMPANY

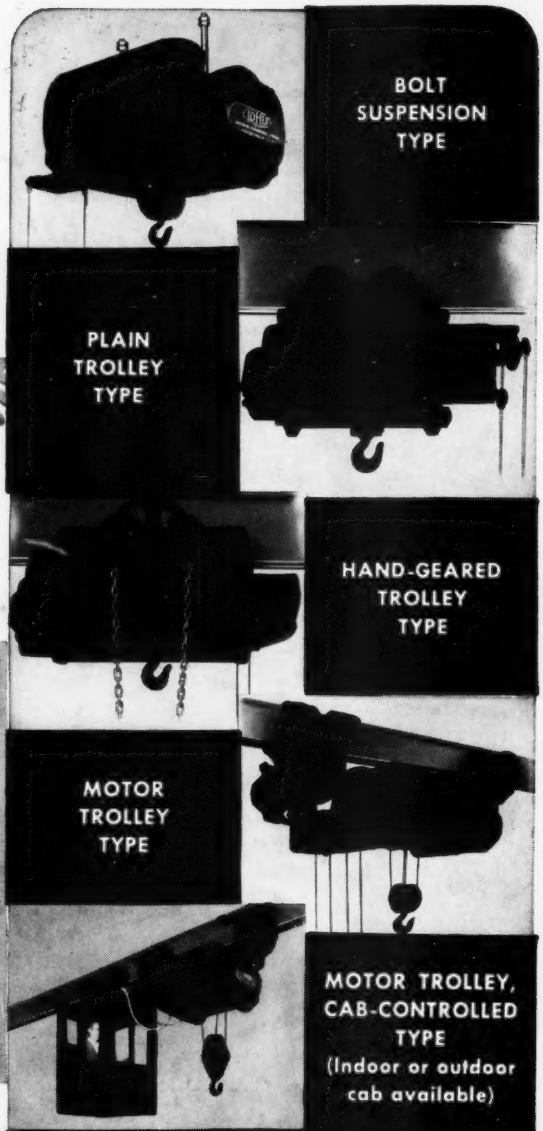
13129 ATHENS AVENUE CLEVELAND 7, OHIO



CHECK YOUR JOB—PICK YOUR TYPE FROM THIS EASY-READING CHART

TYPES OF LO-HED HOISTS		Bolt Suspension	Plain Trolley	Hand-Geared Trolley	Motor Trolley	Motor Trolley Cab Controlled
HAUL (Distance)	No Haul	X				
	Very Short Haul		X			
	Short Haul			X		
	Long Haul				X	
	Very Long Haul					X
HAUL (Repetition)	Often Repeated			X	X	X
	Seldom Repeated		X	X	X	X
HAUL (Speed)	Important				X	X
	Secondary		X	X		
LOAD	Light	X	X	X	X	X
	Heavy	X	X	X	X	X
MANY BAYS TO BE SERVED					X	X

No matter what your lifting and hauling requirements are, you'll find it a very simple matter to select the means of suspension from among the five standard types of Lo-Hed Electric Hoists available. In addition to these types, Lo-Hed is also made in a wide variety of capacities (¼ to 12 tons), hoisting speeds and lifts.


BOLT SUSPENSION TYPE
PLAIN TROLLEY TYPE
HAND-GEARED TROLLEY TYPE
MOTOR TROLLEY TYPE
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(Indoor or outdoor cab available)
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